AMERICAN ARTISAN

WARM AIR HEATING • SHEET METAL CONTRACTING • AIR CONDITIONING

ABLISHED
8 8 0

VEMBER
934

THE AIR CONDITIONING SECTION

Page 23

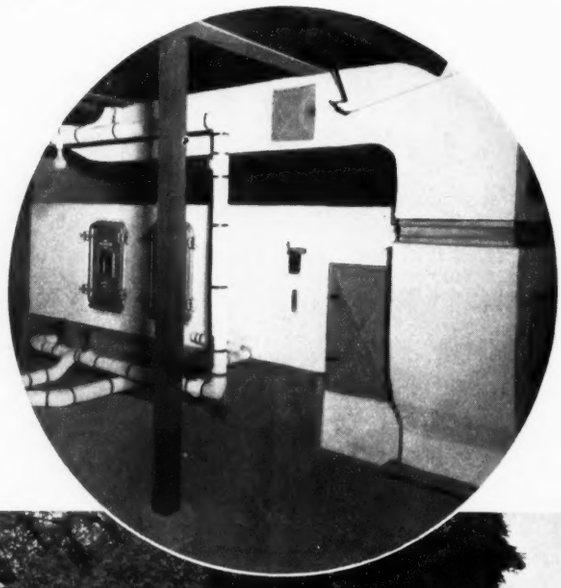
Business pops up in the most unexpected places

Who would ever think of finding sheet metal business, especially an air-conditioning system, in a summer camp? At least one sheet metal contractor did—in the Sugar Grove Camp of the National Cash Register Co., located at Oakwood, Ohio, and illustrated below. He used ten tons of Toncan Iron in the air-conditioning equipment.

This doesn't mean that every summer camp is a prospect for sheet metal work, but it is typical of the many out-of-the-ordinary places where sheet metal contractors can find business—if they leave the beaten paths to look for it.

But you won't have to go out of the way to find the proper metal to use—for Toncan Iron meets every requirement. It is easy to fabricate, and because it is an alloy of open hearth iron, copper and molybdenum, it possesses the maximum rust-resistance of any ferrous material in its price class—hence it lasts longer and reflects to the customer your good judgement in using it.

Write for a copy of "The Path to Permanence." It tells the story of Toncan Iron, and illustrates a wide variety of uses.



TONCAN COPPER MO-LYB-DEN-UM IRON

AIR-CONDITIONS SUMMER CAMP

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO

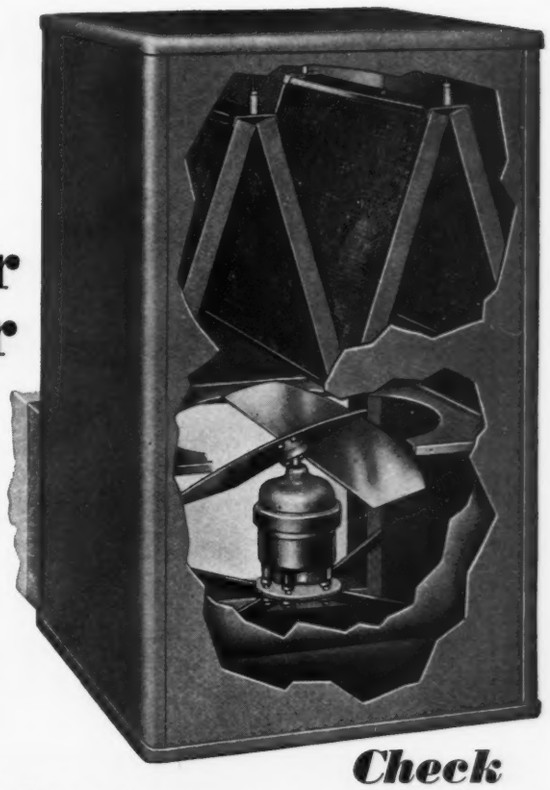
ALLOY AND CARBON STEELS · TONCAN IRON · STAINLESS STEEL · PIPE AND TUBULAR PRODUCTS
BARS AND SHAPES · HOT ROLLED, COLD ROLLED AND SPECIAL FINISH SHEETS · DIE ROLLED PRODUCTS
HOT AND COLD ROLLED STRIP · PLATES · TIN PLATE · NUTS, BOLTS, RIVETS, ETC. · WIRE PRODUCTS

25% Extra Discount

(Special Introductory Discount) brings the

Hold-Heet Winter Air Conditioner

down to Special (Dealer Price F. O. B. Chicago) **$50.50** Complete fully assembled



NOTHING approaches this job

in class, performance, features or value. Few conditioners approach it in capacity or filter area. No other has the absolutely silent Planoidal Blower (Patented HOLD-HEET Development). No other has a motor to compare with the Patented Ballentine Capacitor Motor, specially designed for this super air conditioner. No other conditioner has the background of balanced, interlocking units that can be added one-at-a-time to give Complete Winter Air Conditioning and Summer Cooling.

THE Hold-Heet Planoidal Blower

is one of the greatest aerodynamic developments of recent years. Absolutely silent, it has a static pressure efficiency of 48% (Double usual efficiency). Open design permits free gravity circulation when not running.

THE Ballentine Capacitor Motor

is so efficient that in this unit the ⅛ h. p. motor does a far bigger job than the usual ¼ h. p. in other conditioners that draw twice as much current. Though the capacitor type motor is the most efficient single phase motor that can be built it is seldom used in Air Conditioners for it is so expensive—costs more than twice as much to build as other motors. However, initial costs are paid for again and again in savings in electric current where an ordinary motor is used. This remarkable Capacitor Motor draws only 4 amperes instead of 20 *to start*—does not dim lights when starting, does not snap or click. The Hold-Heet Conditioner operates in *absolute* silence.

NEW Model Welded Steel Cabinet

—Height has been cut down to 51 inches to simplify installations under low ceiling conditions—4 gauges heavier steel, all welded construction thruout, greatly increased rigidity, finished in gray enamel.

COMPLETE, fully assembled, with 100-speed Control Box and Fan Switch, Motor, Blower and 4 filters, it comes ready to hook into the cold air return of *any* furnace . . . a beautiful job at a price that will sell dozens more wherever installed.

HERE it is-- *Your chance to* make immediate volume sales, to identify yourself as the Air Conditioning man of your community. One installation can start you, for it is our experience that each HOLD-HEET CONDITIONER sold sells many more. ORDER NOW for test and demonstration. You are protected by the HOLD-HEET No Risk Guarantee. Use the coupon.

HOLD-HEET "No Risk" Guarantee

HOLD-HEET Controls and Air Conditioning Equipment are manufactured and offered for sale as the finest equipment built. They are GUARANTEED to be superior in construction and performance to any similar equipment on the market, regardless of price.

Any HOLD-HEET UNIT may be ordered and returned if, IN YOUR OPINION after test it does not prove to be superior to any similar product built, and the full purchase price and transportation costs will be immediately refunded.

RUSSELL ELECTRIC CO.

Use the Coupon

Russell Electric Co., Mfrs., Chicago

Check these features and compare

Silent Planoidal Blower

Absolutely silent 22" planoidal blower (patented). Open design permits free gravity circulation.

"100-Speed" Control—1,000 to 2,500 c. f. m. *against pressure*

Adjust capacity to exact household requirements, tune out duct vibrations. Ample capacity for 10 rooms.

2 Year Filters

4 oversize filters, each 20"x30" (Non-sagging, steel frame, "throw away" type). Double ordinary area gives low resistance, free gravity circulation, double-life.

Fully Automatic Controls

Low voltage fan switch operates automatically—only when there is heat in bonnet.

In Cabinet—Ready to Hook Up

Comes assembled in 28"x30"x51" welded steel cabinet, ready to hook into cold air return. Maximum capacity. Minimum floor space. Saves on installation—no cementing, no hood to build.

Universal Model

One standardized production model for all makes and types of furnaces. It is Unit No. 3 of the "Hold-Heet Unit Plan of Complete Winter Air Conditioning and Summer Cooling."

ORDER COUPON

Russell Electric Co., Mfrs.
342 West Huron St., CHICAGO

Send one Cat. No. ACA1 (Unit No. 3) Hold-Heet Winter Air Conditioner, as described at dealer cost of $67.40 less extra discount of 25% as per your introductory offer. It is understood that we are protected by your "No Risk" Guarantee.

Signed .....

Address .....

City..... State.....

Send thru.....
(Jobber)

( ) Check enclosed ( ) Send C. O. D.

(Rated firms will be shipped on open account)

Covering All Activities
in
Gravity Warm Air Heating
Forced Warm Air Heating
Sheet Metal Contracting
Air Conditioning
Ventilating
Roofing

AMERICAN ARTISAN

With which is merged

FURNACES AND SHEET METALS AND Warm-Air Heating

Vol. 103, No. 11 November, 1934 Founded 1880

CONTENTS

NRA U.S. CODE

Published Monthly by
Keeney Publishing Company
6 North Michigan Ave., Chicago
State 6916

◆

Branch Offices
New York
Room 1735
Grand Central Terminal Bldg.
Murray Hill 2-8293

Cleveland
2047 Rossmoor Rd.
Cleveland Hts.
Yellowstone 1540

◆

J. D. WILDER
Editor

◆

Advertising Staff
WALLACE J. OSBORN
R. PAYNE WETTSTEIN
ROBERT A. JACK

◆

F. P. KEENEY
President
W. J. OSBORN
Vice President
R. PAYNE WETTSTEIN
Secretary
CHAS. E. PRICE
Treasurer

Member of Audit Bureau of Circulation
Member Associated Business Papers Inc.

Yearly Subscription Price — Anywhere in the world, $2.00; Single Copies, $.25. Back numbers $.50. Entered as second-class matter, July 29, 1932, at the Post Office at Chicago, Illinois under the act of March 3, 1879.

More than 7,000 copies of this issue are being distributed.

★ ★

STRAIGHT FACTS FOR STRAIGHT THINKING

By *Newton D. Baker*

NEWTON D. BAKER, *CHAIRMAN*
NATIONAL CITIZENS COMMITTEE

1. It is true that billions are being spent by the Government in order that people may not die of cold and hunger.

2. But these billions, divided among the families in need, average for each family only about $24 a month.

3. And 70% of the free hospital services in the United States for the needy sick are provided by voluntarily supported hospitals. The sick among the unemployed number 48% more than among the employed.

4. Likewise public health nurses, also supported by your voluntary gifts, report that 66% of all their visits in 1933 were in homes unable to pay for the service rendered.

5. 30% more children have had to be removed from their own homes and cared for by voluntarily supported children's agencies.

6. Two-thirds of all the arrests for crime involve persons between the ages of 15 and 24 years. Millions of boys and girls living under conditions destructive to character need the character-building services of your recreation agencies.

7. A man may die of despair, as well as of hunger, for suicides, numbering 15,368 in 1928, grew to 20,927 in 1932. This shows that more and more people are ceasing to value the only kind of life they are able to attain.

8. America cannot be rebuilt by relief measures alone.

9. Your local community chest needs your support during this year of rebuilding human hope and morale. It supports hospitals, clinics, child-care organizations, character-building agencies and many other social services.

10. When you give in your city, you strengthen the forces of civilization in the neighborhood in which you live.

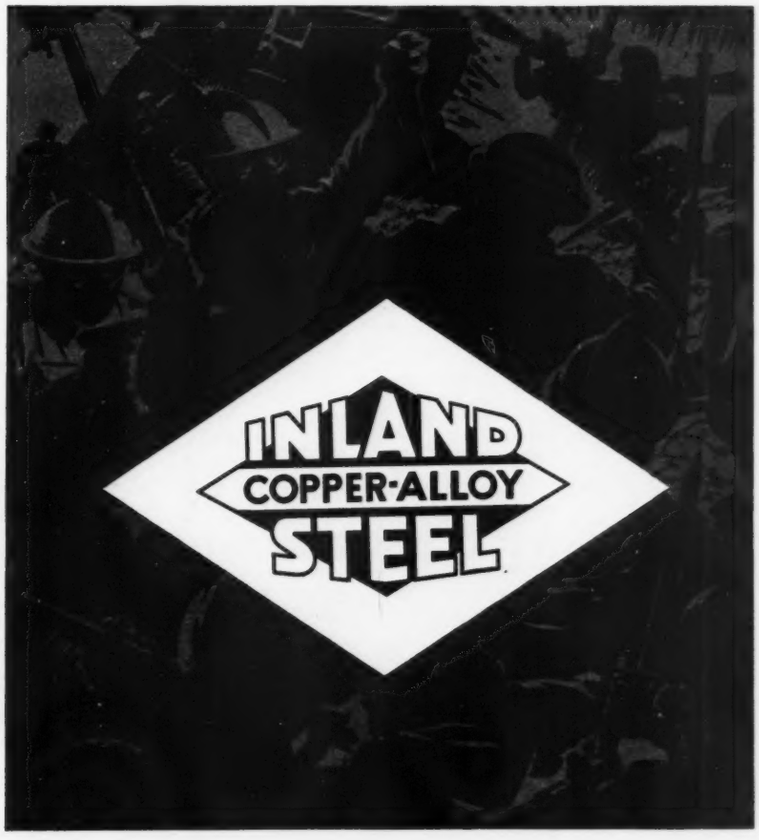
1934 MOBILIZATION FOR HUMAN NEEDS

A MODERN FIGHTING METAL

Fights CORROSION

Fights COSTS

Fights FOR SALES



LITTLE by little, quietly, and too often unnoticed the losses from corrosion add up to a staggering total. Fight it with Inland Copper-Alloy Steel.

It fights corrosion—endures longer than any other ordinary iron or steel wherever there is moist air.

It fights costs—reduces the cost per year of service tremendously at only a slight additional first cost compared with ordinary grades of iron or steel. And it costs less than any other corrosion-resisting material—far less than most.

It fights for sales—gives your products the strongest sales appeal of all, most value per dollar, at very little additional manufacturing cost.

Specify Inland Copper-Alloy Steel for roofs, smokestacks, siding, and the like. Use it in your products wherever corrosion can be a factor.

Available in sheets, bars, plates, structurals, any Inland rolled steel product. INLAND STEEL COMPANY, 38 South Dearborn Street, Chicago, Illinois.

NRA CODE

Most Enduring

Iron and steel sheets have been ranked according to rust and corrosion resistance under atmospheric conditions by the American Society for Testing Materials ranking based on tests at Fort Sheridan, Annapolis and Pittsburgh. Copper-bearing steel sheets lead the list.

INLAND STEEL

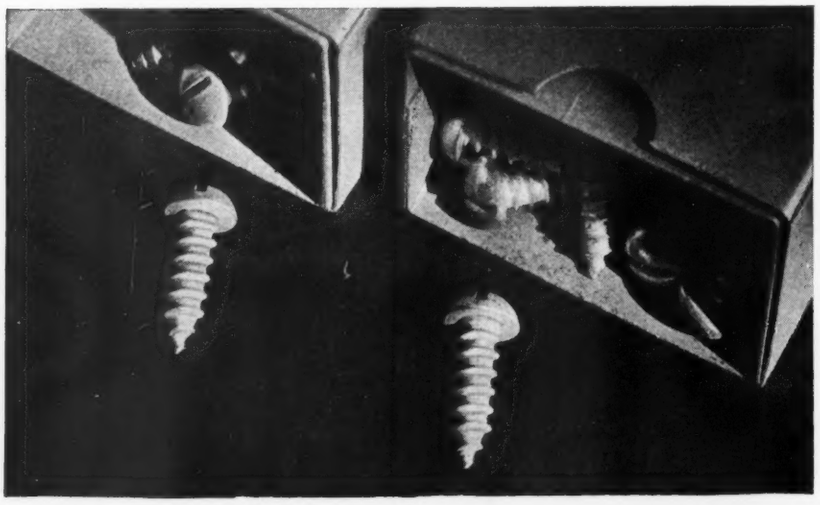
ABLE SERVANT OF THE CENTRAL WEST

Sheets Strip Tin Plate
Plates Structurals Piling
Rails Track Accessories
Bars Rivets Billets

20,000 SHEET METAL WORKERS

prove the worth of these Parker-Kalon time and labor savers

"Looks" are deceiving . . . to be sure of savings specify genuine Parker-Kalon Sheet Metal Screws



An imitation may look like a genuine Sheet Metal Screw. But remember, the genuine product . . . made only by Parker-Kalon . . . effects savings and makes better fastenings, not because of "looks" or hardened threads, but because of the way it is made and what it is made of. Genuine Parker-Kalon Sheet Metal Screws *always* go in easily and quickly . . . *always* form a perfect, strong-holding thread . . . *always* draw up tight without breaking. It is that consistently perfect action which cuts costs. Be sure that the screws you use actually save time and labor . . . specify the name Parker-Kalon when you order.

This Metal Punch Outfit quickly saves its cost

On most every job this fine Hyro No. O.X. Metal Punch Outfit will save time and labor . . . it will return its cost of $5.90 (F.O.B. N.Y.) many times over. Outfit includes Metal Punch, with full set of 7 punches and dies, in a sturdy steel case. Write for descriptive folder.

PARKER-KALON PRODUCTS

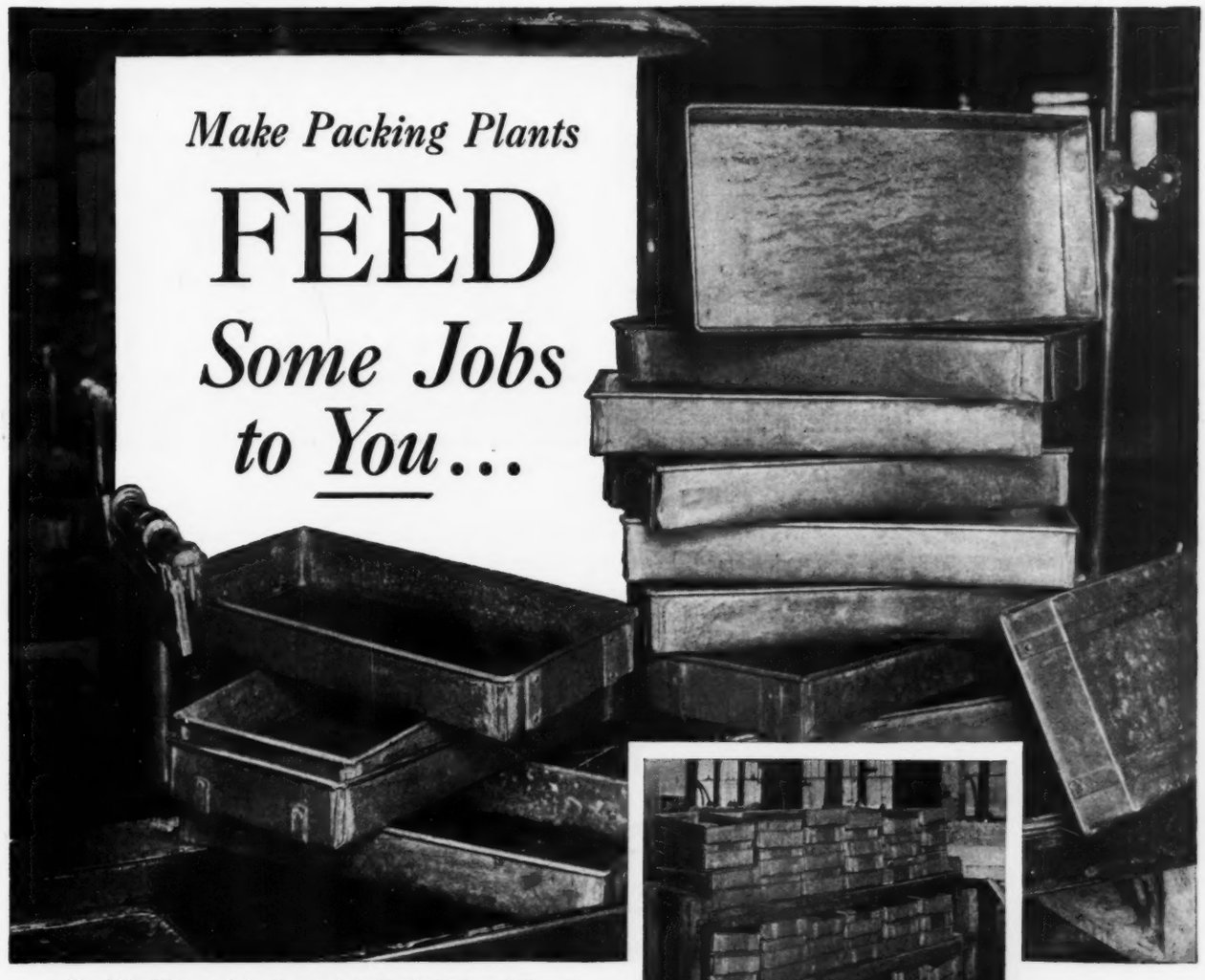
Sold Only by Recognized Distributors

End Time Waste and Bother of getting together parts for a damper control job

Now the two famous Hyro Damper Controls come in handy "complete set" packages containing everything needed for an installation. A great convenience, yet it doesn't cost a cent more.

Each box contains an UNXLD Damper Quadrant (the standard and best control device), or a Hyro Dial Damper Regulator (a thoroughly efficient yet inexpensive control), with the necessary Damper Bearings, correct size Parker-Kalon Sheet Metal Screws for fastening the control to duct, and the rivets required for attaching Bearings to the damper. Sizes to meet your needs are stocked by your supply house. Try these time and bother saving Hyro Sets.

PARKER-KALON CORPORATION
190 Varick Street New York, N. Y.



Monel Metal Sausage Casing Pans made by M. Block & Sons (Chicago) for the Oppenheimer Casing Co., Chicago, Ill. A nice order.

Over one hundred Monel Metal meat packing pans in this one job. Send for our free leaflet, "The Use of Monel Metal for Packing House Equipment". It is full of valuable suggestions that you can turn into money.

HERE ARE A FEW POINTERS ON THE KIND OF *MONEL METAL* EQUIPMENT THEY BUY:

IN practically every town of any size you find at least one or two meat-packing plants. Have you found them in *your* town?

If you haven't you're overlooking a good place to uncover some Monel Metal jobs that pay good money.

Put on your hat right now and go over to see the owner or superintendent of one of these packing houses . . . but don't go empty-handed. Take along some *facts*.

He uses trays, scale pans, ventilating hoods and ducts, mixer linings, table tops, trucks, sinks, hoppers, spice boxes, knife boxes, hoods, viscera pans, and utensils that *are* or *ought to be* Monel Metal.

If any of the above pieces of equipment in his plant are rusting or corroding, or wearing out . . . suggest replacing them with Monel Metal. You know that Monel Metal can't rust, that it is not stained or corroded by meat products, that it's easy to clean, and that it is tough and strong. (Did you realize that Monel Metal is actually stronger than steel? It *is*!) All these reasons explain why Monel Metal is used by the big packing houses, and by practically every big hotel, restaurant, and hospital.

Tell every food packer in your locality these facts. You'll be surprised to see how many jobs you'll pick up. And every job in such a plant often leads to many others. Try it. Send for our free leaflet "The Use of Monel Metal for Packing Plant Equipment". It's full of good sales arguments you can use. Write today:—

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET, NEW YORK, N. Y.

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

Volume 103

Number 11

AMERICAN ARTISAN

Code Progress

Close contact with associations, individuals, code authority officials during the last sixty days has convinced us that the whole matter of code or no code is right now in a critical situation. Lack of progress has killed the enthusiasm first evinced by the contractors. Numerous delays in getting authentic information from Washington and code members who in turn could not get rulings from Washington has set up a lethargy among the contractors which will make it exceedingly difficult to make real progress from now on unless things begin to happen.

Some parts of the country are well organized and all ready to go ahead. Other parts are getting organized in good fashion, but are taking things slowly. Too many parts of the country have done nothing—in fact don't intend to do anything until forced to.

The difference of opinion as to authority to do certain things; the wide difference in interpretation on certain clauses and sections of the code and the subsequent rulings on these sections which have come from Washington; in fact, the very difference in the energy of those responsible for the setting up of code organization has resulted in a spotty condition which may shortly throw the whole proposition into a state of great indifference.

Right now the matter of financing is of paramount importance. Those in charge of whipping code organizations into shape must have money to continue. That money has not been forthcoming. Contractors are indifferent and in many localities downright antagonistic to paying until compelled to.

The industry has attempted to set up an organization empowered to turn the whole industry inside out and given those in charge a few weeks in which to do a job which may take several years. The result is confusion and uncertainty. These must be eliminated before real progress can be made. Right now money is the crux of the situation. Those in charge find it difficult to collect until they show something definite for the contractor's money. And it is difficult to show anything definite unless there is some money with which to work. The circle is endless and vicious.

The only apparent solution is a concentration on a few things made understandable to every contractor by education. This education and emphasis on a few things ought to convince the contractor that the code is a good thing and worth supporting and financing. With a few accomplishments behind us and some money coming in the rest of the program can be taken up in sequence.

We suggest therefore, that organization be centralized and restricted in its scope so that those areas where progress is being made can be organized, leaving the rest of the country for later work. The organized sections can handle their own finances and proceed as rapidly as they wish. Such a concentration on good spots might accomplish more in the end than the attempt to press the organization along the whole front.

▼ ▼

Fall Business

From all parts of the country comes word that business in the heating line is far above any fall season for the last five years. In most parts of the country the season started earlier and has been accelerating at a surprising rate without yet showing any serious sign of falling off.

This is encouraging. We have been waiting a long time for some such sign of business revival and a return to a normal heating season. A surprising fact reported is that a large percentage of the work let to contract has been cash on completion. The money to pay for the work is not coming from loans, but out of the savings of the property owners. Some sections report as much as 85 per cent of the work let being done for cash.

If we add to this cash work the amount of winter work our industry ought to get through F.H.A. and HOLC and then add to this any stimulation which should come when the government starts its drive to help people build new homes—the coming winter looks mighty encouraging. If the recent off-season elections are any indication of the peoples' desire to continue our present program of experiment, then increased confidence should lead people to spend money.

The particular conditions or set of circumstances which have brought about this increased volume may not be known—in fact, we need not seriously worry about the why's and wherefore's. We can be certain, however, that a tremendous portion of this work is coming from those owners who have made stove bolts, baling wire, and strap iron serve till the last possible minute and can no longer heat their houses with the old furnace.

With a renewed willingness to spend and the very real need for repair and replacement work which evidently exists in every community the industry now has a real opportunity to sell the betterments we have been developing these last four years.

Desloge Hospital Fabricated and Erected

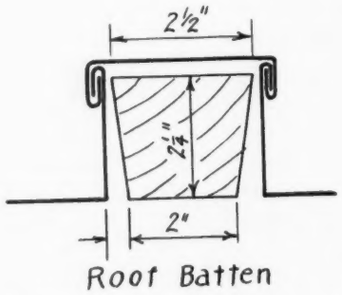
CUTTING costs of erection by means of hanging ladder scaffolds where competitors bid on complete scaffolding, fabricating all sections in a field shop from sheets cut to exact sizes for the job by the manufacturers and employment of several ingenious devices and fabricating ideas, enabled C. J. Scilligo, of General Sheet Metal Works, St. Louis, to finish one of the largest jobs of the 1933 season at a profit on a bid price which might otherwise have turned out to be a loss.

The job, which is one of the outstanding architectural structures of St. Louis is the Desloge Hospital on the near southwest side. The building, as shown in the photographs is a tall, multi-storied structure, embracing within the project a main hospital building, adjoining chapel, power house, nurses' home, and some minor buildings. The dominating feature, as the public views the building from the street, is the high-peaked roof of the main building and the similar roof topped by the ornate fleche on the adjoining chapel.

This view of the central tower shows design of battens, hips, pan sheets.

Sheet Metal

The sheet metal price for main building and chapel was approximately $41,000. More than 25,000 pounds of 16-ounce copper and several hundred pounds of 4-pound hard lead, plus other thousands of pounds of lead-coated copper were used. How this amount of material, in the intricate fabrication required, could be handled at this price makes an interesting story.



Cross section of roof batten showing undercut wood batten, separate cap and pan sheet.

Main Roof

The roof of the main building consists of a large central tower, with duplicate smaller towers at each end and a flat decked mansard connecting the towers together. The construction of the towers is identical; while the construction of the mansard is the same for all sections.

Closeup of valley. Note connection of battens with ridge, flat slope at eave and general appearance of finished roof.

The towers and mansard are structural steel covered with precast gypsum slabs. A layer of 14-pound per square tar paper was laid on the gypsum. Then large battens, of a cross section as shown, were run up and down

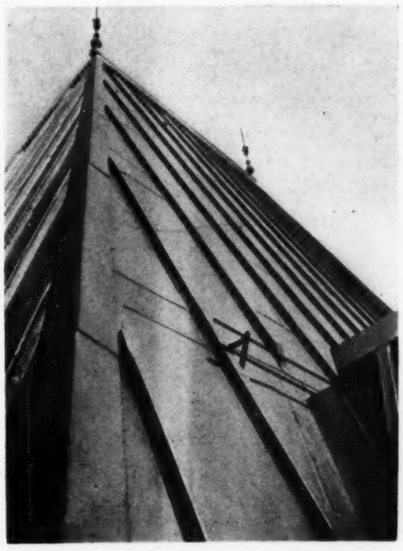
Copper Contract Profitably on a Low Bid

the roof. Because of the size of the towers some of the battens run from gutter to ridge while an equal number end at the hips as shown. The wood battens are undercut for expansion.

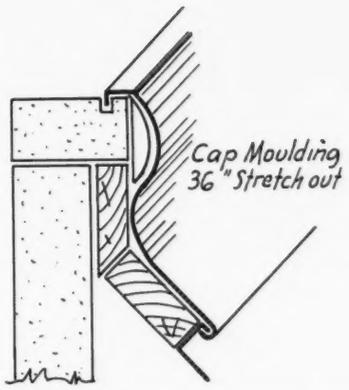
The contractor set up a field shop in the attic space. From the mill, copper for the pan sheets was received in widths which eliminated all cutting. The sheets were put through the brake and formed for a separate cap as shown in a detail. Clips were cut at the same time. The batten caps, likewise were formed from strip copper of a width which eliminated cutting except for length.

Roof Erection

The hips of the towers are quite heavy in cross section. The



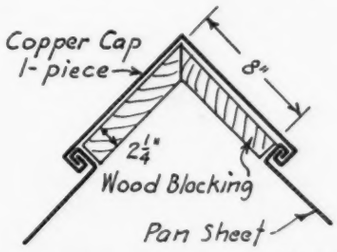
Looking up the main roof along a hip. At the right is a valley between main roof and small dormer. Hip sections are flat locked without solder.



CAP MOULDING AROUND DECKS

Detail showing blocking and construction of mansard roof deck moulding. Cap sheet and pan sheet are locked to form a drip.

wood blocking, as shown in a detail, was laid simultaneously with the battens. The full width of the hip is covered in one sheet,



CONSTRUCTION OF HIPS

Detail of construction of main roof hip showing blocking and construction of cap sheet.

also cut from strip copper bought in the correct width. The pan sheets are brought up to the top edge of the blocking and double locked with the hip cap sheet.

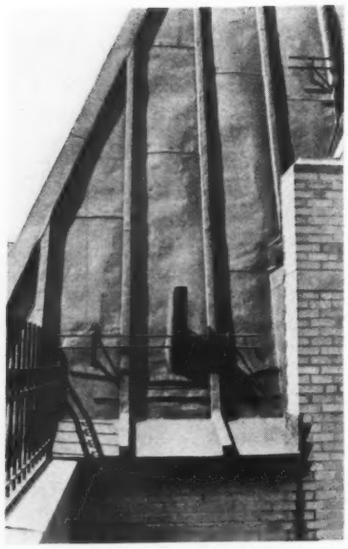
The ridges of the towers are identical in construction with the deck molding of the connecting mansards, except that the ridge

Looking along the mansard molding showing small dormers and one of the end towers.

is continuous over the peak while the molding ends in a flat deck. The construction of the ridge is shown in a detail.

As mentioned, suspended ladder scaffolding was used as follows: the ladders were hung vertically from ropes passed over the ridge of the towers and were raised or lowered by manipulating the ropes. Sometimes one, sometimes two or three ladders were used. Each ladder rested on a completed pan sheet between battens of the section behind the pan sheet section being laid. As a pan sheet was laid and cleated, the ladder was raised for the sheet above. Where more than one ladder was used the sheets being laid were staggered so that the caps could be locked at the same setting. As many as 16 men were used at times on these scaffolds and not a single injury was encountered.

A special tool was used for locking batten caps to pan sheets. This tool consisted of a flat top just the width of the batten with two side sections hinged to the middle. These side sections were turned under into a continuous claw. The middle section was laid on the batten cap which was formed for locking and the claws placed around the edges of the

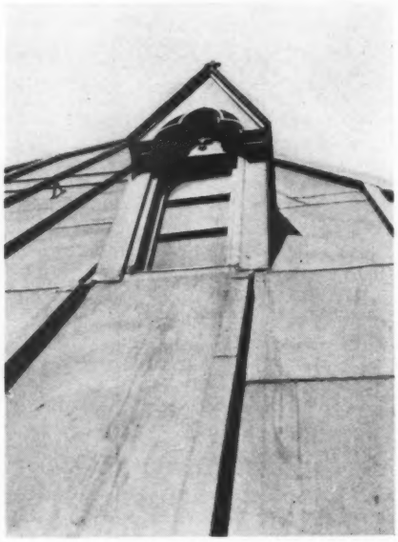


Tower roofs are carried into a flat slope at the bottom with the eave turned into a deep drip. Note staggering of pan sheet seams and bronze snow guards.

cap and pan sheets. The side handles were then forced down thus locking about one foot of batten at one time.

Mansards and Dormers

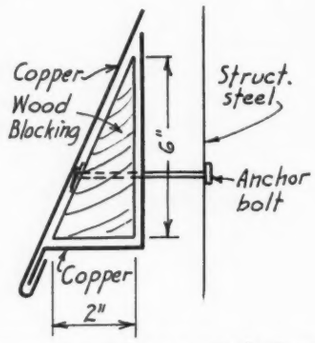
The batten construction of the mansards is identical with that of the towers excepting the deck molding. The construction of the deck molding showing caulking at the top in the masonry and the connection with the pans and battens is indicated in a detail. The



A tower dormer viewed from the gutter. The text explains the assembly of dormer face sections.

cap molding sheet used was formed from a single sheet.

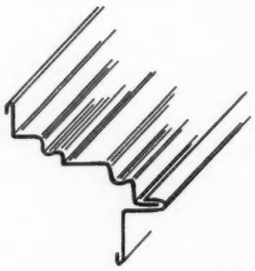
The bottom of the towers and the mansards, excepting above the mansard sections was made by carrying the pan sheets down over a special wood blocking under which a cleating section was laid before the blocking was placed. This edge cleat and the



CONSTRUCTION OF DOME ROOF EDGE ABOVE GUTTER

Tower eaves outside the mansard deck are constructed as shown here. The wood blocking is anchored to the structural frame with a cleating sheet placed under the blocking.

roof sheets were locked and turned down into a drip as shown in a detail. Around the main roof there is a deep gutter which



CROSS SECTION - DORMER MOULDING

Detail of one of the side molding sections of a dormer and connection to face sheet.

starts under the eave drip and continues up the back face of the parapet to a point under the stone cap where the copper is caulked into a horizontal reglet.

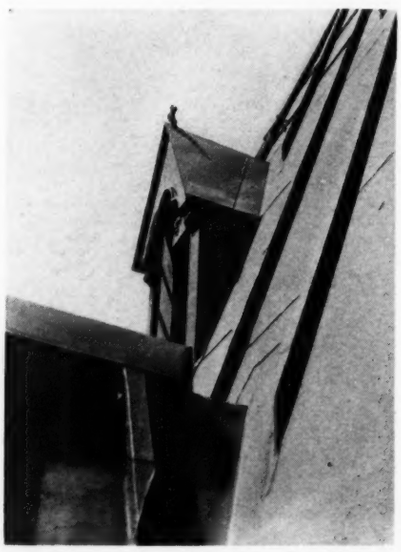
Dormers

One of the small details of interest is the dormers which are cut through the towers and the mansards as shown in the photographs. The dormers are cut into the roof at the base and project out from the roof about 4 feet. There are 13 large dormers (bottom row) and 14 small dormers (top row). Construction is identical for both sizes. The roofs are flat sheets with standing seam locks soldered into the roof sheets as shown.

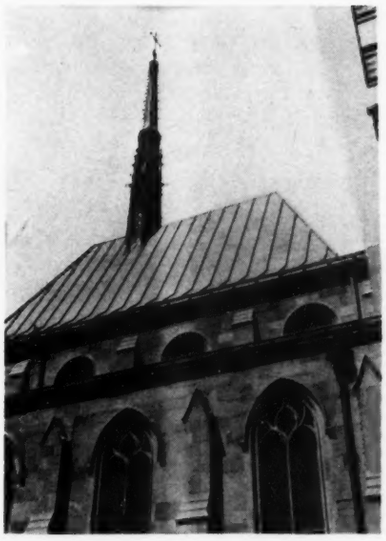
The face of dormer of Gothic design consists of an apex sheet made in two pieces and side moldings with a cross section as shown in a detail. Assembly was apex sheets first, outside moldings, center molding, pillars alongside of the windows.

Chapel

The adjoining chapel has a roof similar in design with the towers of the main buildings but is covered with lead coated copper to match the lead covered spire. The construction and method of applying was identical with the main roof. There is one difference, however—the ornate fleche which stands off the center point on the ridge. The photographs show the general appearance of the different sections of the spire. The base, which straddles the ridge of the chapel is octagonal with ribbed corners and sunken panels ornamented with chevron-like battens. These base section



Closeup of main roof gutter, dormer and battens. Note connection to ridge.



Looking upward to the fleche, downspouts and gutters of the chapel. This roof and accessories are all lead-coated copper.

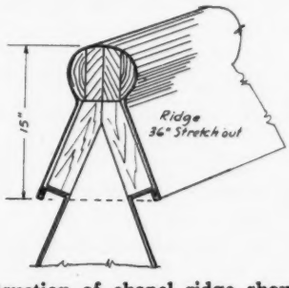
chevrons are formed in the pan sheets as shown in a detail. The adjoining pan sheets when locked make the raised batten.

Spire

Above the base is a louvred, eight-sided section with upper and lower molding. All pieces

Cross section of fleche batten showing the self capping pan sheets.

such as louvre blades, foliated panels, gargoyles, and corner columns with tops were pre-stamped and assembled in 8-foot sections ready for erection on the fleche. Above the crown molding rises the spire proper, an eight-

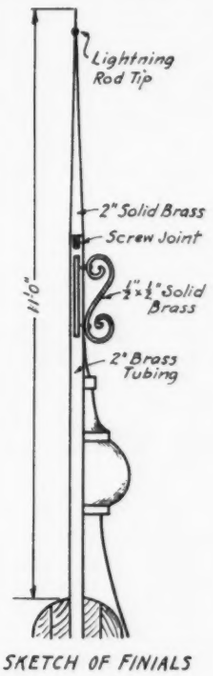


Construction of chapel ridge showing blocking, ridge sheet and connection to pan sheets.

sided section with raised hips and single chevron ornamentation. Here again, the chevrons were formed in the pan sheet and are not separate sections.

The photographs show numerous gargoyles. Each gargoyle was formed complete and forced upon a built-up core having a long brass bar which was screwed into the wood framing of the spire. Where the corner columns stand apart from the spire, these columns were formed complete. On the job a wood post was inserted in the metal column and anchored to the spire framing.

The moldings, ornaments and columns are all hard lead, while

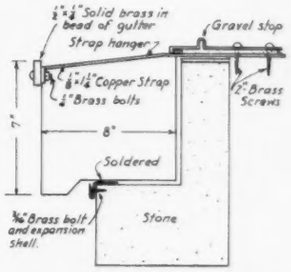


The finial has this unusual construction, being an assembly of fabricated sections on a brass rod and tube core.

the panels are soft lead. Sections were pre-stamped and assembled and then burned on the job. No solder was used on the fleche.

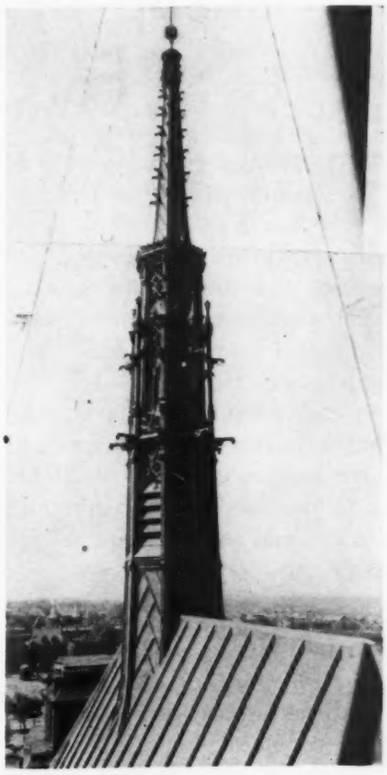
Gutters and Downspouts

There are several interesting gutters and heads. The leaders are rectangular with solid copper straps. One of the photographs shows a head and its delicate ornamentation. Gutter construction is somewhat different as shown in a detail. The boxed gutter is supported on a special stone blocking which forms the back support and a half-base. The gutter is formed from a single sheet which constitutes the back, bottom and front. Along the outer edge of the stone blocking a strip of copper is soldered to the bottom of the gutter lengthwise to

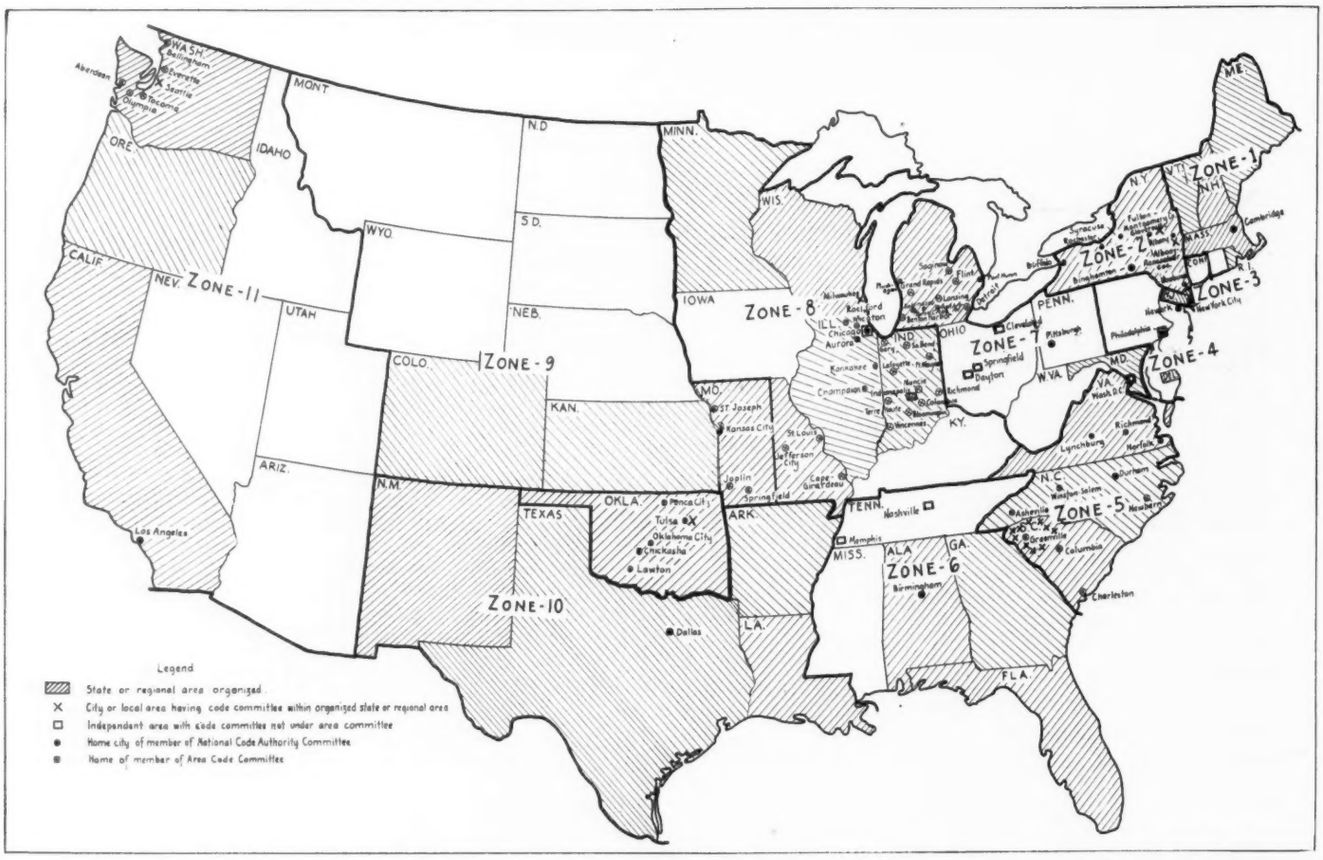


The chapel gutters are constructed as shown here. The method of holding the gutter bottom to the masonry and the ornamented hangers is said to be unusual.

receive an expansion bolt. This strip holds the gutter in place, the strip being formed in such a manner as to cover the head of the expansion bolt.



Looking at the fleche from a main building window. The fleche is all hard lead. Construction is explained in the text.



Makeup of Code Authority Committees For West and Southwest

THE map shown above was published in the October AMERICAN ARTISAN with the statement that names, addresses and firm connections of local administrative committtees for the new areas shown on the map would be published in the November issue. At this writing names, addresses and connections have been received for the states of California, Utah, Washington, Oregon and sub-divisions thereof as follows:

California

METROPOLITAN LOS ANGELES

CHAIRMAN: Charlie Scharf; Standard Roof Company; 1850 E. 41st St., Los Angeles.

VICE CHAIRMAN: W. B. McCullough; Patten-Blinn Lumber Co.; 321 E. 5th St., Los Angeles.

SECRETARY-TREASURER: F. E. Wells, Warren & Bailey Company, 350 South Anderson St., Los Angeles.

MEMBERS AT LARGE: O. E. Woodworth, Woodworth & Turk, 8024 Melrose Ave., Los Angeles; S. C. Leake; Hammond Lumber Company, 2010 S. Alameda St., Los Angeles; Philip R. Wright; Cowan-Wright Roof Co., 2946 W. 15th St., Los Angeles; Phil E. French; French Company, 1074 N. Oxford Ave., Los Angeles; P. B. Warren, Co-Operative Roof Co., 8678 W. Pico Blvd., Los Angeles; F. McMicken, Hollywood Roof Company, 4929 Sunset Blvd., Los Angeles.

SECRETARY MANAGER: Local Code Authority Roofing Contracting Division, W. A. Pruitt, Suite 504, 1709 W. Eighth Street, Los Angeles.

SAN DIEGO COUNTY, ROOFING

CHAIRMAN: T. B. Baker, Baker Roofing Company, 1202 Sigsbee St., San Diego.

MEMBERS AT LARGE: C. H. Benton, Benton Roofing & Paint Co., 2136 Kettner Blvd., San Diego; John Birkel, Birkel Roofing Company, 4236 Los Pinos Ave., San Diego; G. E. Cordrey, Patten-Blinn Lumber Company; 466 First Ave., San Diego; R. L. Cudigan, Standard Roof Company, 3670 41st St., San Diego; E. J. Dailey, Dailey Roofing Company, 1894 Main St., San Diego; H. C. Kern, Kern Roofing Company, 2346 Moore St., San Diego.

SECRETARY: S. V. Weimer, 609 New California Building, San Diego.

CENTRAL CALIFORNIA, ROOFING

MEMBERS AT LARGE: Robert L. Reaves, 280 California Street, Palo Alto; Mr. Price, 425 N. Monterey, Salinas; W. A. Edwards, 72 N. Fourth St., San Jose; W. A. Murphy, Box 216, Route 3, Santa Cruz; E. L. Atkinson, 120 N. Morrison St., San Jose.

SECRETARY: W. A. Edwards.

SAN JOAQUIN VALLEY, ROOFERS

CHAIRMAN: T. A. Osborne, Faris-Osborne Company, 720 Fulton St., Fresno.

VICE-CHAIRMAN: C. E. McMullen; C. E. McMullen Company, 1225 Broadway, Fresno.

SECRETARY: S. N. Scherzer, Route 10-544, Fresno.

MEMBERS AT LARGE: D. H.

Coffman, D. H. Coffman Company, 1837 Merced St., Fresno; M. E. Carlock; Cross Lumber Company, Merced; Virgil Hodgson, R. E. Hodgson & Son, 108 E. Bellview, Porterville.

LOCAL ADMINISTRATIVE COMMITTEE, HARBOR AREA, LOS ANGELES COUNTY

CHAIRMAN: Geo. A. Thomsen, Thomsen Brothers, 1500 W. Anaheim, Long Beach.

VICE-CHAIRMAN: W. H. Davidson, Owen Roofing Company, 900 W. Broadway, Long Beach.

SECRETARY-TREASURER: L. H. Smith, Patten-Blinn Lumber Co., 1201 W. Broadway, Long Beach.

ASSISTANT SECRETARY & EXECUTIVE MANAGER: George N. Swartz, 433 E. 11th St., Long Beach.

MEMBERS AT LARGE: Paull Maull; Hammond Lumber Company, 1532 W. Anaheim, Long Beach; J. G. Meadows, J. G. Meadows Roof Co., 2000 California, Long Beach; Earl L. Card, Card Roofing Company, 1427 California, Long Beach.

ORANGE COUNTY, ROOFERS

CHAIRMAN: George L. Vance, Vance Roofing Company, 114 S. Harvard Ave., Fullerton.

VICE-CHAIRMAN: Raymond R. Ross, Owen Roofing Company, 220 W. 3rd St., Santa Ana.

MEMBER AT LARGE: Hugh W. Warden, Service Roofing Co., 125 W. Santa Fe Ave., Fullerton.

LOCAL ADMINISTRATIVE COMMITTEE, ROOFERS, SAN GABRIEL VALLEY

CHAIRMAN: John W. Lytle, John W. Lytle, 136 N. Huntington Dr., Pasadena.

VICE-CHAIRMAN: C. E. Eppard, C. E. Eppard, 81 N. San Marino, Pasadena.

MEMBERS AT LARGE: J. T. Strong, Strong Roofing Co., 2120 S. Electric, Alhambra; J. A. Ellis, J. A. Ellis & Son, 1571 Corson St., Pasadena; E. W. Roenne, Foothill Roofing Co., 112 E. Lime St., Monrovia.

SECRETARY: R. M. Engstrand, 1203 Fair Oaks Ave., South Pasadena.

TRI-COUNTIES, ROOFERS

MEMBERS AT LARGE: Harry Kyle, Kyle Roof Service, 1630 Fairview, San Luis Obispo; E. R. Hewston, H & H Roofing Co., 108 N. Salsipuedes St., Santa Barbara; C. H. Reeder, Peoples Roof Service, Fillmore.

SECRETARY: W. Olivarius, 108 North Salsipuedes Street, Santa Barbara.

RIVERSIDE, SAN BERNARDINO COUNTIES

MEMBERS AT LARGE: P. M. Swart, 4873 Park Ave., Riverside; H. J. Morris, 620 East 6th St., Colton; F. H. Cockerham, 3975 Seventh St., Riverside; L. Merrifield, Elsinore; Ross Kennedy, 1898 Mt. View Ave., San Bernardino.

SECRETARY: A. D. White, Room 2, Fox Theatre Bldg., Riverside.

EAST BAY COUNTIES, ROOFERS

MEMBERS AT LARGE: T. T. Parish, New Art Roofing Co., 1307 Fruitvale Ave., Oakland; S. S. Wells, Bay Cities Asbestos Co., 188 Tenth St., Oakland; L. L. Elliott, Elliott & Elliott Rfg., 1429 Sixty-sixth St., Oakland; N. V. Heathorn, N. V. Heathorn Rfg. Co., 354 Hobart St., Oakland; R. W. Fiege, Crown Roofing Co., 2609 E. 14th St., Oakland.

SECRETARY: F. A. Mero, Mastercraft Tile & Roofing Company, Box 1086, Richmond.

SAN DIEGO COUNTY, SHEET METAL CONTRACTORS

PRESIDENT: W. Weckerly, San Diego Sht. Mtl. Wks., 1225 Market St., San Diego.

MEMBERS AT LARGE: R. F. Buechner, Coronado Sht. Mtl. Wks., 955 Orange Ave., Coronado; T. Liddiard, Winn Sht. Mtl. Wks., 7641 Fay St., La Jolla; G. H. Humphrey, Escondido Sht. Mtl. Wks., Escondido.

SECRETARY: W. G. Ehmcke, W. G. Ehmcke Sht. Mtl. Wks., 365 15th St., San Diego.

SAN FRANCISCO COUNTY, SHEET METAL CONTRACTING

CHAIRMAN: George A. Wieland, (Architectural Sheet Metal) Capitol Art Metal Co., Inc., 1129 Howard St., San Francisco.

SECRETARY: John L. McGrath, 666 Mission St., San Francisco.

MEMBERS AT LARGE: W. H. Boothby, Dohrman Hotel Supply Co., 972 Mission St., San Francisco; H. E. Hickey, W. P. Goss Co., 4640 Geary St., San Francisco; Wm. O. Muther, Scott Company, 243 Minna St., San Francisco; George E. Riddle, Riddle Sht. Mtl. Wks., 1061 Folsom St., San Francisco.

VICE-CHAIRMAN: Fred P. Green, Atlas Htg. & Ventilating Co., 557 4th St., San Francisco.

LOS ANGELES COUNTY, SHEET METAL INDUSTRIES

MEMBERS AT LARGE: C. H. Specht, Calif. Cornice Wks., 1620 N. Spring St., Los Angeles; J. A. McCloskey, McCloskey Sht. Mtl. Wks., 1154 Broadway, Long Beach; H. S. McClelland, McClelland Htg. & Ventilating Contractors, 1928 S. Compton Ave., Los Angeles; Fred W. Dee, Dee Sht. Mtl. Wks., 1732 E. 14th St., Los Angeles; James H. Jones, Jones Heating Co., 497 S. Broadway, Pasadena.

SECRETARY AND CODE AUTHORITY FOR TRADE AREA OF LOS ANGELES COUNTY—W. G. Boles, 366 Chamber of Commerce Building, Los Angeles.

NORTHERN CALIFORNIA, WARM AIR HEATING & SHEET METAL CONTRACTORS

MEMBERS AT LARGE: S. W. Terry, Aladdin Heating Corp., 5107 Broadway, Oakland; Walter M. Dunphy, 3136 Folsom Blvd., Sacramento; Chas. A. Merritt, Chas. A. Merritt & Son, 584 S. 1st St., San Jose; E. A. Baird, Broadway Sht. Mtl. Wks., 1142 H. St., Fresno; R. E. Fraser, Fraser Furnace Co., 445 S. San Joaquin St., Stockton; Geo. W. Bagley, Redwood City Sht. Mtl. Wks., 502 Arguello St., Redwood; Geo. Wilson, Wilson Sht. Mtl. Wks., 1019 19th St., Bakersfield; W. H. Hargis, Anderson, Cougherty & Hargis, 225 Main St., Salinas; E. A. Winn, Ed's Sht. Mtl. Wks., P. O. Box 334, Porterville; Frank M. Booth, Booth Sht. Mtl. Wks., 220 3rd St., Marysville; Robert Hansen, Hansen's Sht. Mtl. Wks., Modesto; Mr. Kindig, Kindig's Sht. Mtl. Wks., Santa Rosa; N. F. Bard, Bard Sht. Mtl. Wks., Box 542, Ukiah; Thos. Warburton, Warburton Plbg. & Htg. Co., 214 E. 4th St., Madera; Jack Allen, Allen Sht. Mtl. Wks., Redding.

SECRETARY: H. O. Lothrop, 1700 Broadway, Oakland.

SAN FRANCISCO, ROOFERS

MEMBERS AT LARGE: T. Hemi, Alta Roofing Co., 976 Indiana St., San Francisco; Arthur Smith, Roofing Service Co., 549 Castro St., San Francisco.

CHAIRMAN: F. J. Dunn, F. J. Dunn Roofing Co., 3597 Mission St., San Francisco.

VICE-CHAIRMAN: James Reilly, Roofing Contractor, 20 Isabel St., San Francisco.

SECRETARY: Ben Sand, Reliable Roofing Co., 331 Flood Ave., San Francisco.

TREASURER: Henry Dissmeyer, Acme Roofing Co., 21 Lippard St., San Francisco.

EXECUTIVE SECRETARY: Robert F. Smith, 61 Clementina Street, San Francisco.

STATE CODE ADMINISTRATION COMMITTEE

CHAIRMAN: J. W. Bender, J. W. Bender Roofing & Paving Co., 18th & Bryant, San Francisco.

VICE-CHAIRMAN: Allyn Burr, Allyn Burr Roofing Co., 2417 28th St., Sacramento.

(*Continued on page* 64)

F.H.A.

Its Repair and Modernizing Program

By Percy Wilson
Regional Director for Kentucky, Indiana, Illinois and Wisconsin

FOR the purpose of this article forget your own political affiliations and remember that as citizens your first consideration is the immediate welfare of our community and that as business men your natural contribution to that welfare is to operate a successful and profitable business and thereby do your share in creating employment and renewed activity in your particular field of industry.

That is exactly what the New National Housing Act proposes to help you do. "But it's going to cost the Government some money," somebody says. Certainly it's going to cost the Government some money, but if you and I tried to do what the Government is doing, it would cost us a great deal more and do much less good.

The Government has no intention of wasting any money to carry out this Act. The Government expects to get every cent of this back out of the increase of business and labor volume, leaving a surplus in the pockets of labor, finance, industry, property values, and community welfare.

The Building Market

In normal years there is approximately $5,750,000,000 of building construction of which $1,500,000,000 is in homes. During 1933 there was only $1,255,000,000 of which only $300,000,000 was spent in home construction. It is a known fact that practically speaking, there has been comparatively little or no new building construction in most of our communities for almost six years, in spite of the fact that during the same period there has been greater obsolescence and depletion of standing buildings than in any previous similar period.

There are sixteen million houses today in the United States rapidly going to pieces for want of repair or reconditioning. There are an untold number of small business buildings and income properties being operated at a loss for want of repair, remodeling or modernizing. This condition does not exist because there is no demand for repairs and building work. It exists because our usual real property financing channels were completely closed up.

An Example

For instance, here is a young man who was sent to me by his employer with the highest of recommendations. He owns a two-flat on the South side. His mortgage is up-to-date. His taxes are paid, as far as the county will permit. He has a good job. He wants to build a brick porch. He has a bid from a responsible contractor of $1,000. Do you know where he can get a second mortgage for a thousand dollars? How can he raise the funds? I think he is a sufficiently good risk to warrant a bank in making him a commercial loan. But that would be for ninety days and he couldn't pay the money back in ninety days or six months or even a year. But he can pay it back under this Act and the bank be better protected.

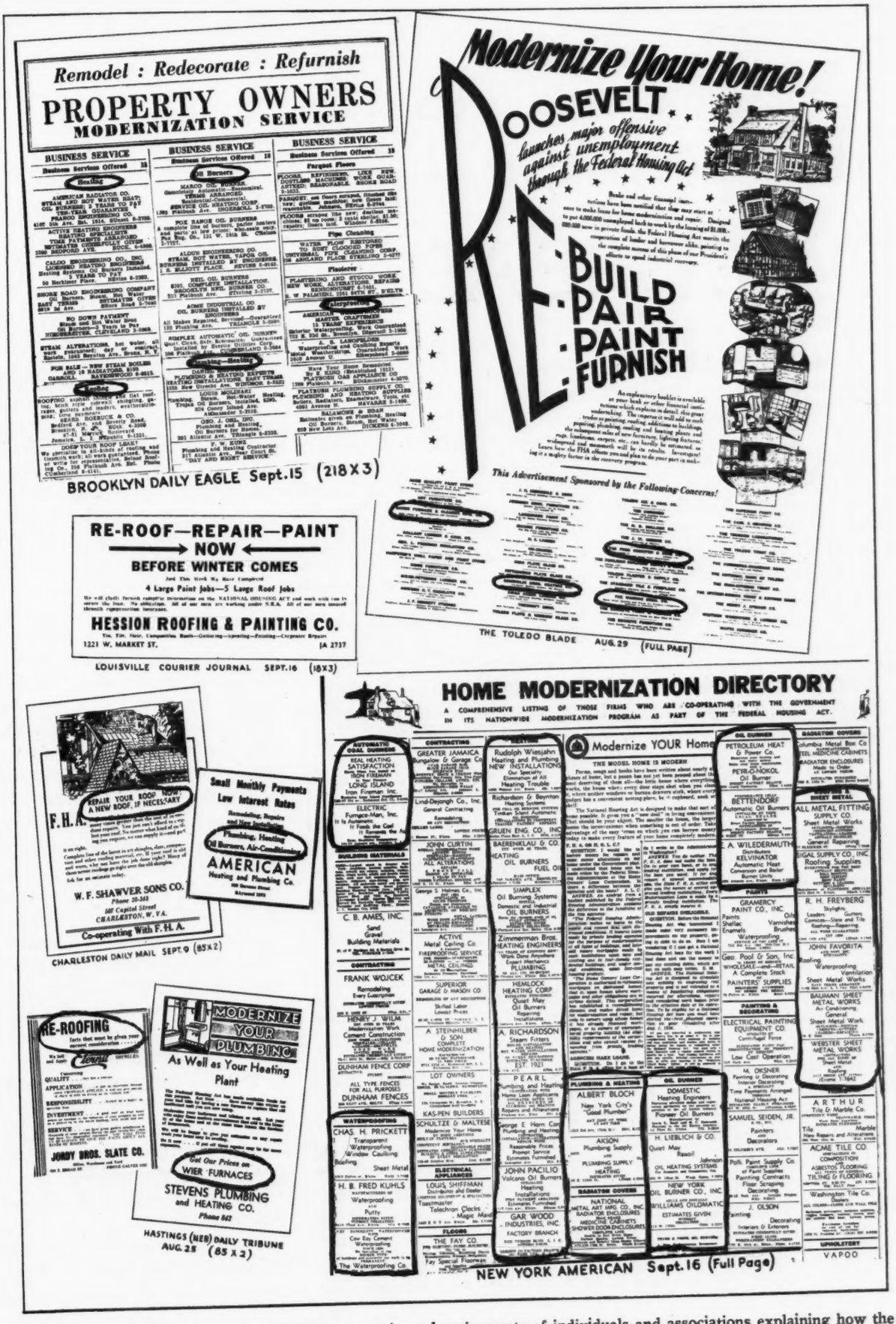
The National Housing Act passed by Congress under date of June 27, 1934, is divided into five sections known as titles, title one is known as the modernization section and is designed to instigate immediate building activity for that great demand which now exists for necessary re-conditioning and repairs. After this has been put under way there follows under title two of the Act the creation of mutual mortgage insurance for the purpose of liquifying mortgages on real property. And under section three of the Act authority is granted to organize large national mortgage associations under Federal Charter for the purpose of creating ample financing for new building construction. The work under these last named titles will follow the work we are now doing. Title four has to do with the insurance of savings and loan accounts, and title five has to do with Home Loan Banks principally.

[*For detailed information on the provision of the act see American Artisan for October.*]

The handling of modernization credits under this plan is very broad and simple. Any qualified property owner may obtain from any qualified financial institution a Property Owner's Credit Statement blank. This when filled in and signed by the property owner provides all the information required by the Federal Housing Administration, from which eligibility under the Act is determined. With this blank the property owner applies for the financing he requires, not through the government office, but to his own bank or any other qualified financial institution.

Consider the case of a property owner who decides he wants to make certain improvements, has obtained estimates, and has decided how the job will be done. The property owner may go di-

(*Continued on page* 63)



Newspapers all over the country have been carrying advertisements of individuals and associations explaining how the public can take advantage of the new modernizing and repair legislation. Here are a few typical advertisements and newspaper sections.

Columbus, Ohio, Association Investigates That Elusive Subject — OVERHEAD

By

Edw. R. Armstrong

OVERHEAD, I believe, can be truly described as being the most elusive, misunderstood and yet, the most vital item entering into the subject of cost.

This statement is made because of the difficulties in determining the correct total amount involved and in the proper application and distribution of these amounts so that we may know what to charge for our services that we may receive a legitimate profit from our operations.

What is profit? Profit is a monetary gain resulting from a service rendered after all materials and labor entering into that service are paid for and after all costs incident either directly or indirectly to the rendering of that service has been equitably proportioned or absorbed.

To view this subject in its proper light, one of the first fundamental principles must be appreciated and that is, that a net profit has not been acquired until every item of expense has been accounted for including such controversial items as salary for owner, interest on investment, depreciation and reserves.

It is true that the subject of overhead is pertinent at this particular time because practically all Code Regulations specifically state, "that business shall not be done below cost." We maintain that this subject would be just as important today Code or no Code for the simple reason that the intense and savage competition that has developed in the last ten years makes it imperative that we know and fully appreciate the necessity of knowing what our goods or services cost. A lack of this knowledge is often instrumental in firms or individuals accepting contracts at the other fellow's figure resulting often in

Overhead is oftentimes the margin between profit and loss. Don't forget to include it in estimates.

disappointing and meager returns and often times in failure.

The most illogical of business judgments is the one that we often hear, "If Bill Jones can do that job for so much, so can we." This same Bill Jones may be ignorant of the most simple principles involved in the computing or application of overhead. The argument is sometimes advanced that Institutions thirty-five or forty years ago did not have any complicated set-ups or spend much time in studying the subject of overhead. This is true but it also has been found, upon investigation, that the gross profit that most concerns added over and above their cost of material and labor were far in excess in percentage of the amount added today in most competitive lines where competition is exceptionally keen.

The writer knows of a number of firms in the so-called "old days" that used a method of first determining the cost of labor and material and then doubling this amount to determine selling price.

Try this method today and see how much business you secure.

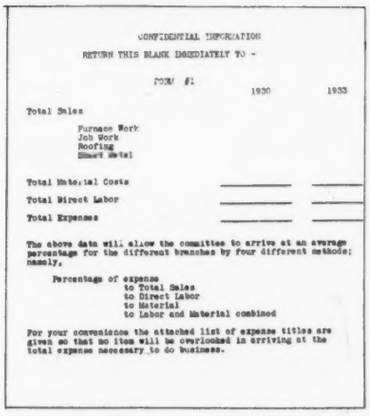
Correct costs are most essential today for several reasons.

First—So that we may secure a profit.

Second—That we may analyze our business to the extent of securing knowledge concerning certain operations of our business which are truly profitable and those which are not profitable.

Third—To protect us against ourselves. In other words that having a full knowledge of our costs we are less liable to accept business at competitive figures which might eventually prove our undoing.

Costs are primarily composed of material, labor and overhead. Overhead can be divided under three different headings, namely, General expense, Selling expense and Factory expense.



CONFIDENTIAL INFORMATION

RETURN THIS BLANK IMMEDIATELY TO -

FORM #1

	1930	1933
Total Sales		
Furnace Work		
Job Work		
Roofing		
Sheet Metal		
Total Material Costs		
Total Direct Labor		
Total Expenses		

The above data will allow the committee to arrive at an average percentage for the different branches by four different methods; namely,

Percentage of expense
to Total Sales
to Direct Labor
to Material
to Labor and Material combined

For your convenience the attached list of expense titles are given so that no item will be overlooked in arriving at the total expense necessary to do business.

Form letter number 1 was mailed to Columbus association members asking them to itemize their 1930 and 1933 operations.

It is conceded by most concerns and individuals that the cost of material and labor can be properly accounted for by the use of proper records and proper care in the preparation of these records.

We now come to the subject upon which volumes have been written and that is a proper method of overhead distribution.

Overhead, as we know, varies as to the incidental cost in rendering a service and in the application according to the volume of business which we do. The generally accepted methods of application are:

Number One—A fixed charge for each productive hour regardless of the classification of employee.

Number Two—A relative proportion in percentage of the overhead expenses to the direct labor charge.

Number Three—A relative proportion in percentage of the overhead expenses to the amount of material used.

Number Four—A relative proportion in percentage of the overhead expenses to the combined amount of material and labor used.

Number Five—A relative proportion in percentage of the overhead expenses to the volume of business done.

In considering this subject there is another fundamental point involved which we must recognize.

After analyzing our business and determining a method we propose to use we must positively stick to that procedure. If we do not our cost sheets will be misleading and our overhead will not be properly absorbed.

To illustrate this point further —we will assume that we are using the method of applying overhead in relationship to productive labor. We determine from our previous experience that in doing a stated amount of business we paid out a specific sum for direct labor. We also know

Indirect Labor (Not charged direct to Job)
Supplies (not charged direct to Job)
Repairs to machine & tools
Repairs to building and building expense
Pattern expense
Insurance (Fire)
Taxes
Depreciation (On equipment, building, stock & Automobiles)
Light and Power
Rent Paid
Salesmen's salaries and expenses
Advertising
Collection and exchange
Discount on Sales
Subscription to Trade Journals
Office Salaries (Include manager or proprietor)
Office expense & supplies
Stationery & Printing
Telephone & Telegraph
Legal expense
Donations
Dues & Membership
Auto repairs and supplies
Auto Insurance
Interest paid (On borrowed money)
Rent
Liability Insurance & Accident Expense
Spoiled & Defective Material
Freight on supplies and returned goods
Repairs to guaranteed Jobs
Employee's Bonus
Experimental Work
Miscellaneous General Expense

So that members could not overlook any item of overhead, this list of overhead items was supplied.

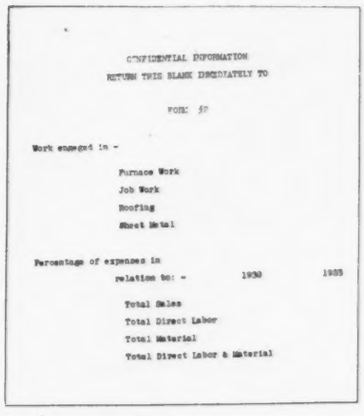
the exact amount of our overhead in doing this particular volume of business. These are definite factors. We then find the percentage that expenses are to the total amount of direct labor and decide that we will use this factor for the coming year. We will assume for the point of illustration that after this year's business has been done we found that we had done approximately the same amount of business and that the factor of direct labor and expenses were approximately the same.

During the year, however, we may have had a number of jobs come up which required an excessive amount of labor in proportion to the material and in our reasoning we decided that the job would not carry that much overhead, so we pare down our figures to an amount which we think will be in line with competition. It can readily be seen that having established a definite factor on a definite premise that if we vary from this procedure the only results that will accrue will be unabsorbed expenses which will be strikingly apparent when we close our books for the year.

Some months ago our local association appointed a Committee to investigate this subject preparatory to Code operation. This investigation revealed some decidingly interesting facts.

To assemble and secure some definite information concerning our particular Industry, we mailed to all members of the association forms Number One and Two respectively with a letter explaining the use of these Forms. A list also was submitted with the title of Probable Expense Divisions. A number of these accounts, of course, could be consolidated but the detailed division was given so that practically no item would be overlooked.

As a result of this survey, we found percentages ranging from Twenty per cent to Three Hundred and Forty-five per cent.



CONFIDENTIAL INFORMATION

RETURN THIS BLANK IMMEDIATELY TO

FORM #2

Work engaged in -

Furnace Work
Job Work
Roofing
Sheet Metal

Percentage of expenses in relation to: -	1930	1933
Total Sales		
Total Direct Labor		
Total Material		
Total Direct Labor & Material		

Form letter number 2 to members determined the breakdown of kinds of work done.

SHEET 5-A. JOB WORK—ROOFING AND SHEET METAL

	1930				1933			
	Percentage of Expenses to							
	Sales	Direct Labor	Material	Labor & Material	Sales	Direct Labor	Material	Labor & Material
	..	114	54	37	..	106	40	29
	28	94	68	39	37	130	100	57
	29	81	88	42	50	230	140	90
	18	70	35	..	42	185	95	..
	14	40	34	20	27	82	65	36
High	29	114	88	42	50	230	140	90
Low	14	40	34	20	27	82	40	27
Average	22	80	56	34	39	146	88	53
	FURNACE WORK							
	26	189	48	38	30	188	62	47
	24	129	50	36	32	226	72	54
	44	227	105	72	30	150	73	50
	30	163	80	51	35	236	77	58
	33	231	65	50	32	170	77	53
High	44	231	105	72	40	127	47	60
Low	24	129	48	36	40	236	77	60
Average	31	188	69	49	30	127	62	47
					33	183	68	54

That is, the relative percentage of overhead expenses to the total amount of labor and material used.

The figures were requested for both the years of 1930 and 1933 as we considered 1933 sub-normal and would be somewhat misleading if we attempted to use the figures for that year only.

It will be noted on the Forms that a classification was made covering—

Furnace Work,
Job Work,
Roofing and
Sheet Metal.

The final summary was made combining Job Work, Roofing and Sheet Metal under one heading. Furnace Work under one heading and finally a listing of those who did all four classes of work.

A detail of this summary is given on Data Sheet Number 5.

Breaking this report down we find in the year of 1930 the Furnace classification was 49 per cent; in 1933, 54 per cent.

The Job, Roofing and Sheet Metal classification in 1930 was 34 per cent and in 1933, 53 per cent.

Firms doing all classes of work in 1930 ran 49 per cent and in 1933 was 138 per cent.

Combining both years, also all classes the general average resulted in 66 per cent.

If we then eliminate the three highest and the three lowest we get a result of 51 per cent. This is shown in detail on Data Sheet Number 6.

After careful consideration our Committee concluded to recommend the application of Overhead in percentage relative to the total labor and material involved. This the Committee felt would be the most equitable means of distribution for our Industry, as the Industry is composed of a large number of small and medium-size shops.

(*Continued on page* 60)

SHEET 5-B. ALL BRANCHES—FURNACE—JOB—ROOFING AND SHEET METAL

	1930				1933			
	Percentage of Expenses to							
	Sales	Direct Labor	Material	Labor & Material	Sales	Direct Labor	Material	Labor & Material
	37	100	93	48	101	491	345	200
	68	224	218	90	38	127	117	62
	42	54	108	36	176	600	812	345
	58	78	198	40	34	30	153	24
	27	64	62	31	72	105	256	59
High	68	224	213	90	83	243	317	137
Low	27	54	62	31	176	600	812	345
Average	46	104	136	49	34	30	117	24
					84	266	366	138

SHEET 6. COMBINED 1930 AND 1933 ALL CLASSES

Number Reporting	Relation of Expenses to Labor and Material Expressed in Percentage		
3	20 to 29		
7	31 to 39		
4	40 to 48		
8	50 to 59	General Average	66%
2	60 to 62		
1	72	Eliminating 3 highest	
2	90	and 3 lowest—	
1	137	General Average	51%
1	200		
1	345		

Committee's estimate was that the average percentage for 1934 would be—

Furnace work 50%
Job, Roofing and Sheet Metal.....40%

which was recommended as a minimum to the Association.

Air Conditioning Section

Devoted to the technical and merchandising problems of air conditioning in homes and small buildings

ARTICLES discussing air conditioning can be divided into two general groups—those which treat the theoretical and abstruse and, secondly those which deal with the practical, everyday problems.

--- It is the aim of this air conditioning section to stick to the everyday problems of which there are dozens which the installer encounters.

--- Sometimes it is hard to demonstrate that the material presented in this section really relates to air conditioning. The outsider thinks of air conditioning in terms of cooling, drying, special air treatment and so forth, whereas we in the actual business of designing and installing find our real problems much more elemental.

--- For example, in this issue there is an article on heat loss from ducts and a quick method of calculating such losses. What has this to do with air conditioning, says the layman? To us it is a serious problem, for we have to consider it on every job.

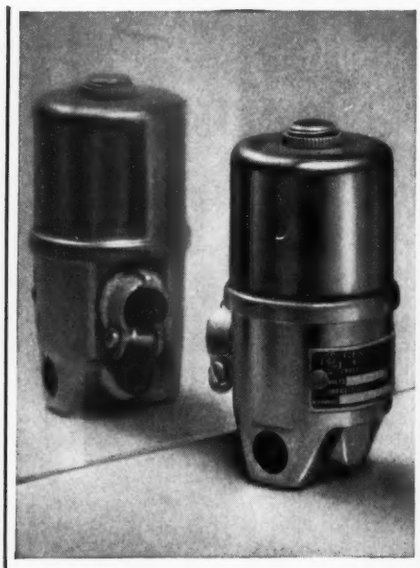
--- We invite your suggestions on other problems you want discussed.

DEPENDABLE ELECTRIC ACCESSORIES BUILD YOUR PROFITS

The RIGHT MOTOR for FANS and BLOWERS QUIET . . . CARE-FREE . . . EASILY INSTALLED

For belt-driven fans and blowers requiring up to 1/4 hp., you can't go wrong if you select the G-E Type KH split-phase motor (illustrated).

It's dependable. It's easily installed because of its simplified, built-in terminal box, and because of its slotted base, which reduces the adjustment of belt tension almost to a matter of seconds. Add to these a lubrication system that provides *once-a-season* oiling, drip-proof end flanges that keep maintenance *down* by keeping undesirable materials *out*, and cushioned-power rubber mounting, and you have an equipment "buy" that's built to last.



NEW, electrically operated VALVE SMALL . . . COMPACT . . . LOW-PRICED

Ideally suited to air-conditioning needs, this new electric valve will handle water or low-pressure steam quickly, easily, and economically, by remote control.

It provides positive operation over a wide range of pressures and temperatures. It is economical—it uses only 7 1/2 watts at 110 volts, 60 cycles. Its parts are sealed in steel —no stuffing box. A handy, built-in terminal box saves installation expense. A convenient metering pin provides 50-per-cent-flow regulation —no extra valve is needed.

If you have a large task for a little valve, this valve will save you money.

A NEW STARTING SWITCH . . . Inexpensive . . . Compact . . . Provides positive protection

This new, small, motor-starting switch meets the demand for positive overload protection for fractional-horsepower motors.

Housed in a strong, steel case with an attractive aluminum face plate, it is easily installed—convenient conduit knockouts in top and bottom. It is equipped with unusually large, pure-silver contacts—an assurance of long life and trouble-free service. It has a snap action—prevents slow opening or closing, and also prevents burning of contacts.

Your name on the coupon is a good investment!

To maintain and protect your reputation for service and dependability, it will always pay you to insist on the highest quality when buying electric equipment. For quality and correctness of design, order General Electric wire and wiring devices along with your motors, control, etc.

GENERAL ELECTRIC

General Electric Company, Dept. 6D-201, Schenectady, N. Y.

Please send me the following publications, as checked:

☐ GEA-1276A, Type KH motors

☐ GEA-1761, NEW starting switches for small motors

☐ GEA-1847A, Solenoid Valves

☐ Also, please place me on your list to receive regularly your new information service covering small motors for air-conditioning applications.

Name.....

Firm.....

Street..... *City*..... *State*.....

070-50

NIGHT AIR COOLING

[PART 2]

By S. Konzo

Cooling for comfort by means of ventilation has received widespread attention this past summer. A number of elaborate tests have been conducted from which a mass of data has been secured. Some of this data needs interpretation in the light of practical usage. The purpose of this paper is to present practical suggestions for the average installer in an average residence installation

Methods of Night Air Cooling

There are four common methods by which night air cooling can be accomplished, as follows:

1. Gravity circulating through open windows.
2. Gravity circulation with aid of wind operated, roof type ventilators.
3. Attic fan installation.
4. Basement fan installation, using ducts in forced-air system.

Gravity Circulation Through Open Windows

This method is the simplest of all, but is not as positive in effect as the other three methods. In the case of a two-story house with only the windows on the second story left open, the effectiveness of cooling is not very great, except when the wind is blowing through the house. Conditions can be very materially improved in such cases, however, by the opening up of all the windows on the first story in addition to those which are left open on the second story, and by opening up an access door or ceiling register into the attic space. In this arrangement the attic windows should be left open day and night, with suitable louver arrangements provided at the window openings to prevent the entry of rain into the attic space.

The access door or register into the attic space should be left open only during the night hours when the night circulation is desired. Since the heated air of the house will tend to rise towards the top of the house during the night hours, a natural circulation of air will be established, with the air entering the house through the windows on the lower story and escaping out of the house through the attic windows. As mentioned at first, however, this method may not prove very effective in house structures where the first story windows are locked up at night.

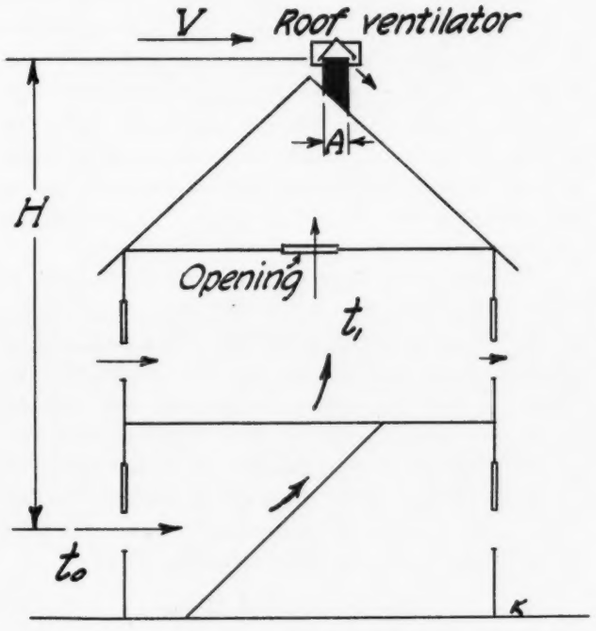
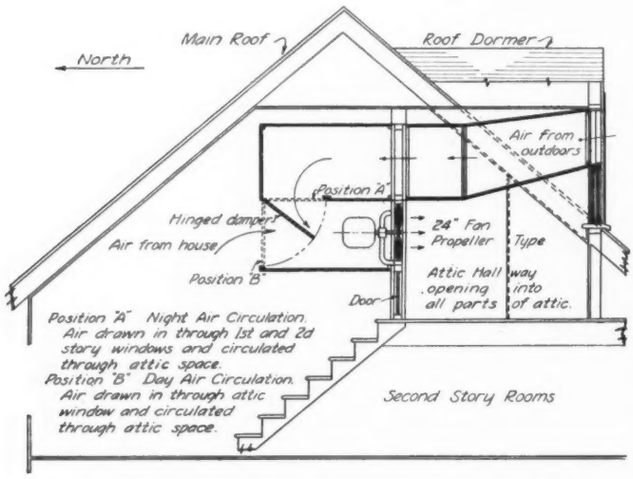


Fig. 3—Diagram showing typical installation of a gravity-type wind operated roof ventilator and relationship of measurements to air movement.

Gravity Circulation Plus Gravity Ventilators

This method is a modification of Method 1 and differs from it only by the addition of a wind-operated roof ventilator, which tends to aid the natural gravity circulation existent in the house structure. The diagrammatic sketch shown in Fig. 3 shows a method of installing such equipment in a residence structure. Note that some form of opening in the second story ceiling must be provided to allow the air to enter the attic space. If the attic windows are left open in an installation such as that shown, the outdoor air may tend to short-circuit directly through the attic into the roof ventilator, and hence may reduce the effectiveness of the night cooling of the lower stories. In the daytime, however, such open attic windows will tend to clear out the air in the attic space and will tend to keep it from heating up as much as it would without any circulation of air.

On page 508 of the 1st volume of Harding and Willards book is a short discussion of the air handling capacities of roof type ventilators. In the discussion is presented the following equation for the determination of the air handling capacities for common types of roof ventilators:



Arrangement of attic fan in Research Residence

$$Q = \frac{A}{60}\left[\frac{36\sqrt{H\,(t_i - t_o)}}{6+V} + 20\,V\right]$$

where, Q is in cubic feet per minute,

A is the throat area in square inches,

H is the height of the stack effect in feet,

t_i is the indoor air temperature,

t_o is the outdoor air temperature,

V is the wind velocity in miles per hour.

As an example of the use of the formula let us assume that: the throat area, A, of an 18-inch ventilator is 255 sq. in., H is 35 feet, and V is 6 miles per hour. For this special case, the formula reduces to the following expression:

$$Q = 510 + 75.5\sqrt{t_i - t_o}.$$

When the outdoor air temperature is five degrees lower than the indoor air temperature the air handling capacity, Q, will be approximately 680 c.f.m. Even though there would be some additional effect caused by the air blowing directly through the house, it may be seen that one ventilator is hardly sufficient for most purposes. In any case, the ventilating action is greatly dependent on the wind motion, and in times of calm outdoor conditions the action may be decidedly small. For instance, when the wind velocity is 2 miles per hour, instead of 6 miles per hour as in the above example, the air handling capacity of the ventilator would be only 423 c.f.m., for the 5 degree differential between indoors and outdoors, instead of 680 c.f.m.

In contrast to these two methods, the methods of night air cooling designated as numbers 3 and 4 are positive in their action regardless of outdoor wind conditions.

Attic Fan Installation

This method of night air cooling is especially worthy of consideration on account of the possibility of obtaining large air handling capacities with a minimum input of electrical energy. In the Research Residence tests a 24-inch propeller fan was installed at the top of the stairs leading to the attic space. The outdoor air was drawn in through the open windows into the fan, and was then blown out into the attic space. The air delivery of 3,980 c.f.m. required 3.85 kilowatt-hours of energy for each 12 hours of operation during the night. Let us assume that the total season of night cooling operation is four months, and that the fan would be in operation 25 nights in each month. The total energy consumption for the 100 nights of operation would then be 100 times 3.85 or 385 kilowatt-hours for the entire summer. The seasonal operating cost for the fan for various rates of energy cost would be as follows: $23.10 for a 6-cent per kilowatt-hour rate, $19.25 for a 5-cent rate, $15.40 for a 4-cent rate, and $11.55 for a 3-cent rate. These figures are offered as an indication of the probable costs under the conditions assumed.

Windows and Doors

It may be evident that in an attic fan installation, outdoor air can be moved through a room only if means are provided for the entrance and exit of the air from the room. If, for instance, the windows on the first story are locked at night, the amount of cooling to be expected on the first story will be very small, since air can not be taken out of the rooms unless at the same time some means are provided for the air to enter the rooms.

Similarly, in installations where the bedroom doors to the hallway are closed, it will be necessary to provide ceiling register openings from each bedroom to the attic space. See Fig. 4 for three suggested methods of installation of an attic fan. The arrangement shown in Fig. 4c, permits the circulation of outdoor air through the attic space alone in the daytime, provided that door A is closed and window B is opened.

Where some degree of control is desired of the air quantity taken out of each room, an exhaust duct system should be provided with ducts leading directly from each ceiling register directly to the intake side of a centrifugal type fan. See Fig. 4a. Note that in this exhaust duct installation a propeller type fan is not suitable since the propeller fan is not designed to deliver air against any suction resistance and should be used only where the inlet and outlet resistances are negligible.

The Problem of Noise

The greatest problem to be encountered in attic fan installations is that of noise prevention. Since

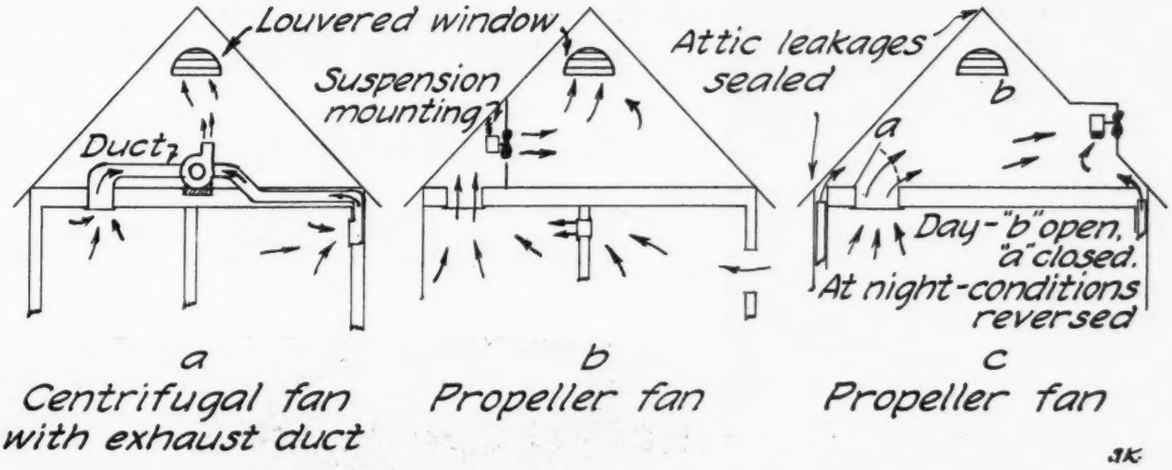


Fig. 4—Diagram showing three typical attic ventilating fan arrangements and suggested air movements within the structure.

the fan is usually located over sleeping quarters and since noise is particularly annoying during sleeping hours, the matter of noise prevention is one of greatest importance. The conclusions of G. B. Helmrich and G. H. Tuttle as presented in their paper, "Comfort Cooling with Attic Ventilating Fans" is of significance in this respect. These investigators found that in a properly installed sound-insulated installation of a centrifugal type fan, it was necessary to limit the fan speed to about 300 r.p.m. The limiting register air velocities for ceiling type registers was determined as about 400 feet per minute. The noise of a propeller type fan installation was found by them to be execessive for tip speeds of the fan exceeding 3,200 feet per minute. This would mean that the maximum allowable speed for a propeller fan would be as follows for various diameter fans: 24-inch diameter fan is 425 r.p.m., 22-inch fan is 465 r.p.m., 20-inch fan is 510 r.p.m., and 18-inch fan is 565 r.p.m. These investigators also reported that the capacitor type motor was particularly well adapted for this service from the standpoint of quiet operation.

The suspension of the fan from the roof joists with spring suspension mountings is a method which has been advocated by Mr. W. S. Kingsbury, and should give quieter operation than the method of mounting the fan on the attic floor. In this method the fan is suspended on springs attached to the roof joists, and no rigid connection exists between the vibrating parts and the house structure.

Basement Fan, Using Forced-Air System

This method, which is also positive acting, is that which makes use of the same basement fan in the forced-air system that is used during the winter heating system. Since it offers the opportunity of making year around use of the fan equipment, this method should be particularly of interest to installers of modern forced-air equipment. A suggested duct arrangement is shown in Fig. 5. It may be noted that the door, D, is made to swing up and block off the return duct, A, when it is desired to take in outdoor air through duct B.

The particular advantages that the basement

(*Continued on page* 42)

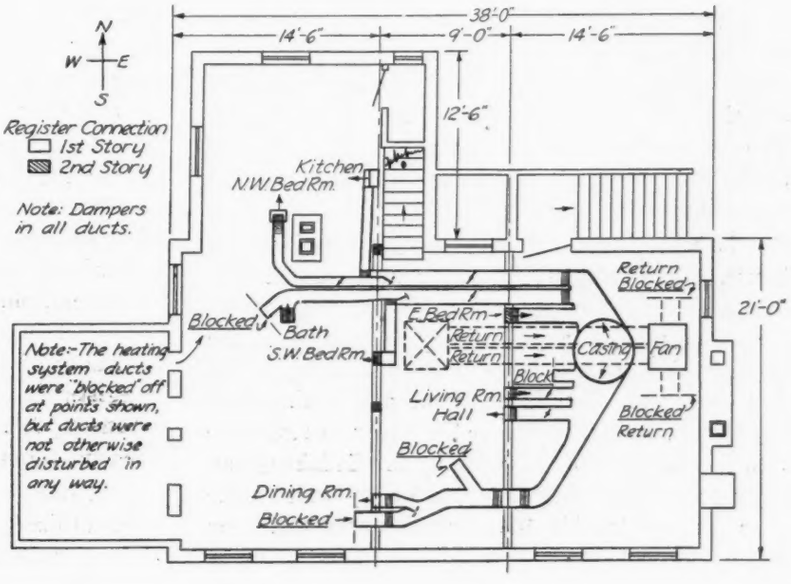
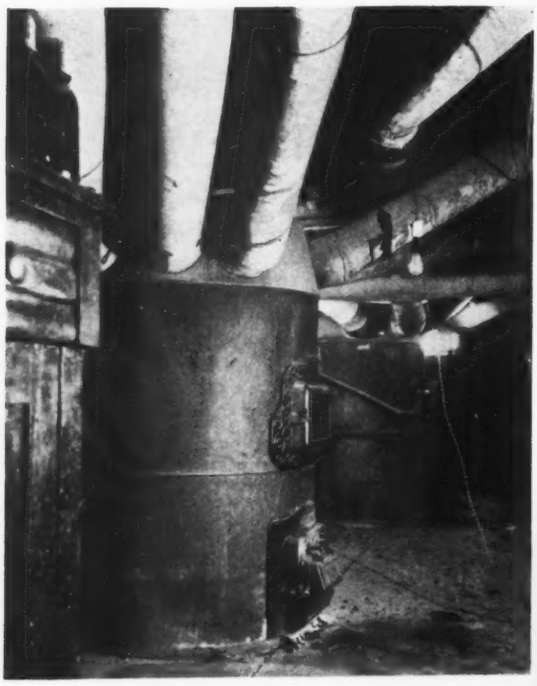
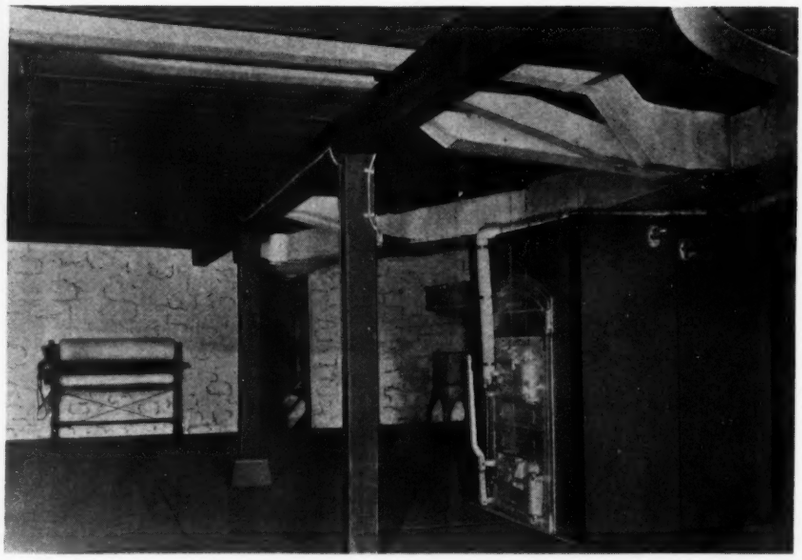


Fig. 6 — Basement piping plan of the forced warm air installation in the Research Residence at the University of Illinois. This system was tested for night cooling, using the regular heating blower.

Air Conditioning Leads To Modernizing And Another Home is "Taken Off The Market"





"Before"—The basement of the Koke residence with the old heating equipment in the center of the room. Notice how the pipes make useless any space not directly occupied by the two heating plants.

"After"—The same basement space after the Air Conditioning Unit was installed out of the way against the wall. The ducts not requiring elevation are shown in the joist spaces, also out of the way.

MOST contractors have heard of people who disposed of a home or other piece of property because they despaired of ever being able to heat it properly.

The experience of a St. Louis heating contractor demonstrates that a modern air conditioning system can change this despair to contentment, in a way that is beneficial to the owner and profitable to the furnace dealer.

The rather large residence of A. J. Koke, of St. Louis, had been equipped with two gravity furnaces, which failed to keep the 11 rooms, two baths and the halls comfortable during the winter season. The question kept recurring in the Koke household, "Shall we keep this house any longer, when we cannot keep it warm?"

It was while this question was before the house, that a St. Louis heating contractor, the Callahan Heating Company, heard about the heating

After making a preliminary inspection of the house which has a cubage of approximately 17,000 feet exclusive of the basement, and noting that very long runs were required in order to reach the rooms at the rear of the building, the Callahan company prescribed one air conditioning unit as the cure for the trouble that two furnaces had been unable to correct.

Their next step was to make a detailed study of the heat loss requirements of the house, room by room. Calculations were made in accordance with the B.t.u. method. The requirements were found to be 147,432 B.t.u. per hour.

When the heating requirements of each room were known, the layout was made. The layout was designed to use as many of the old registers and risers as were of sufficient capacity for the new installation. As can be seen from the layout, which is reproduced here, all of the old registers and risers were retained, thereby reducing the cost of the new air conditioning system.

However, several new runs were installed because the piping of the old system was thought inadequate for heating requirements of the building. For example, on the second floor two rooms were invariably served by one pipe and riser, with two registers, one register for each room. In the new installation one register was removed and the entire capacity of such a run was delivered through one register to one room only. Then an entirely new run—pipe, riser and register—was made to the second room.

None of the old round piping in the basement was utilized. A trunk line, rectangular duct system was installed, with rectangular branch ducts, in the

joist spaces, extending from the main duct to risers and registers. All warm air ducts were covered with asbestos paper to improve appearance and assure that the joints were air tight. Locking type dampers were placed in every duct so that the system could be properly balanced and the flow of air through the ducts individually regulated.

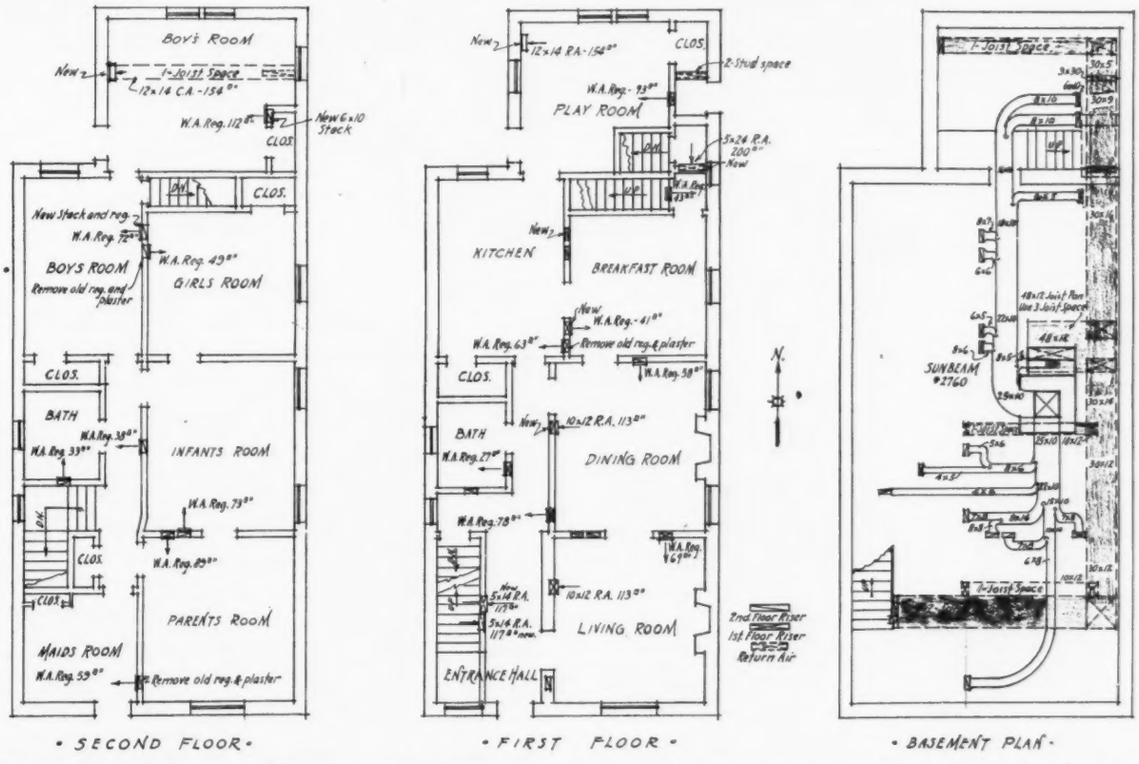
The first and foremost improvement, in the owner's mind at least, is the fact that every part of the entire home is now adequately and uniformly heated. And he is sold on, and appreciates, the benefits of humidified, cleaned, filtered and circulated air, which the air conditioning unit provides.

The basement has become useful, usable space, with the air conditioner back against one wall and with practically all ducts high, out of the way, in the joist spaces. The two old furnaces deprived the occupants of their most valuable basement space. The crisscross pipes of the two furnaces had reduced basement head room to 5½ feet. One coal bin now suffices, releasing more useful space. Formerly there were two bins. Labor saving is another result of this installation. There is only one fire to feed. Only one lot of ashes to remove.

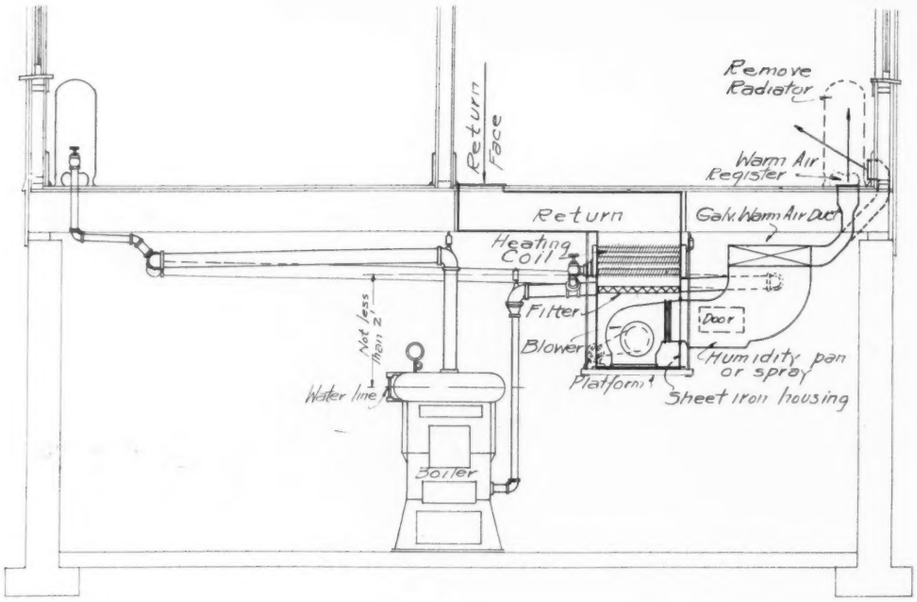
Air conditioning in this home was followed by additional modernizing and renovating. Hard wood floors were laid throughout the first floor rooms. The entire house was redecorated. These improvements, plus the additional basement room have created a more attractive, roomier, and more comfortable home —and have increased the value.

The residence of A. J. Koke, St. Louis, Mo., in which an air conditioning unit replaced 2 gravity furnaces.

Basement appearance has been furthered by the choice of apparatus. The Sunbeam air conditioning unit has a square casing, finished in red and black, crackle enamel. With coal, hand-fired, it has a capacity of 148,000 B.t.u. per hour at the registers. It is equipped with blower delivering the 1900 c.f.m. required for this installation at 367 R.P.M. The system is designed on a register temperature of 150° and a velocity through the registers of 300 F.P.M. The fan stops and starts on bonnet temperature while fire is controlled by one thermostat and a damper motor.



The layout of the Koke installation. While it was necessary to provide several new runs, all of the old registers and wall stacks were utilized. While some of them were undersized for gravity air circulation, all were of sufficient capacity for air conditioning because of the higher velocity at which the air is forced.



Air Conditioning for Radiator Heated Houses

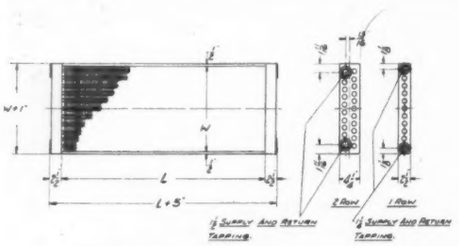
By Platte Overton

Strict attention must be given the selection of the proper heat transfer section when we air condition houses heated by direct radiation. We should realize that this selection necessitates information different from that we use daily. This article takes up the selection of the proper coil. If there are any points you do not understand, write us.

IN this article we will discuss the equipment to be installed. Bear in mind that we are to cool rooms 101-102-104 (See Fig. 20) as well as heat them. As stated in the October issue of the AMERICAN ARTISAN we have a total of 884 c.f.m. that we must heat from 70 degrees (return air) to 140 degrees (plenum chamber temperature) or 140 — 70 = 70 degrees rise.

In Fig. 15 is shown a commercial type of heat transfer unit. These units may be be termed coils, blast heaters, indirects, etc. This unit may be purchased in almost any capacity and to any and all practical dimensions. Such dimensions are important, as this job we are discussing is a vapor system, and we must have 18 inches differential between the water line of the boiler and the return trap from the heat transfer unit. Fig. 17 is taken from a typical performance table by a well known manufacturer of heat transfer units. This table is based on 5 pounds of steam pressure, and as we have a vapor system in which the maximum pressure will be 1 pound or less it is necessary for us to use the conversion table in Fig. 18.

In Fig. 17 we note that various face velocities are given from 200 to 1,200. For face velocity we divide the c.f.m. (in our problem 884) by the de-



NET FACE AREAS IN SQUARE FEET

"H"	"L" DIMENSION											
	6	9	12	15	18	24	30	36	42	48	54	60
6"	.25	.375	.50	.625	.75	1.0	1.25	1.50	....	....	....	....
9"	.375	.563	.75	.938	1.13	1.5	1.88	2.25	....	....	....	....
12"	.50	.75	1.00	1.25	1.50	2.0	2.50	3.00	3.50	4.00	....	....
15"	....	.938	1.25	1.56	1.88	2.5	3.12	3.75	4.38	5.00	....	....
18"	....	....	1.50	1.88	2.25	3.0	3.75	4.50	5.25	6.00	6.75	7.50
21"	....	....	....	2.19	2.63	3.5	4.38	5.25	6.13	7.00	7.88	8.75

Fig. 15—Drawing showing dimensions and table for selection of a heat transfer coil. Such dimensions are highly important as coils are expensive and the correct size must be selected.

CONVERSION TABLE

Entering Air Temp.	Steam Pressure in Pounds per Square Inch (Gauge)																
	0	2	5	10	15	20	30	40	50	60	80	100	125	150	175	200	250	300	350
-40	1.109	1.138	1.176	1.230	1.275	1.315	1.383	1.439	1.487	1.529	1.602	1.663	1.729	1.787	1.838	1.883	1.963	2.035	2.097
-30	1.065	1.094	1.132	1.186	1.231	1.271	1.339	1.394	1.443	1.485	1.556	1.619	1.686	1.743	1.794	1.839	1.919	1.991	2.053
-20	1.021	1.050	1.088	1.142	1.187	1.227	1.295	1.350	1.399	1.441	1.514	1.575	1.641	1.699	1.750	1.796	1.875	1.947	2.009
-10	.977	1.006	1.044	1.098	1.143	1.183	1.250	1.306	1.356	1.397	1.470	1.531	1.597	1.656	1.706	1.751	1.832	1.900	1.933
0	.933	.962	1.000	1.054	1.100	1.139	1.206	1.262	1.310	1.353	1.428	1.487	1.554	1.611	1.662	1.707	1.786	1.856	1.920
10	.885	.916	.954	1.010	1.056	1.096	1.163	1.219	1.266	1.309	1.382	1.443	1.510	1.566	1.618	1.664	1.744	1.815	1.876
20	.845	.876	.912	.966	1.015	1.051	1.119	1.174	1.223	1.265	1.338	1.396	1.465	1.523	1.574	1.620	1.700	1.771	1.832
30	.801	.830	.868	.922	.966	1.007	1.076	1.130	1.179	1.221	1.294	1.355	1.421	1.479	1.530	1.575	1.656	1.727	1.788
40	.757	.786	.824	.877	.923	.963	1.030	1.086	1.134	1.177	1.250	1.311	1.378	1.435	1.486	1.531	1.612	1.683	1.744
45	.735	.764	.802	.856	.901	.941	1.009	1.064	1.113	1.155	1.228	1.289	1.355	1.413	1.464	1.510	1.590	1.661	1.722
50	.713	.742	.780	.834	.879	.919	.986	1.042	1.091	1.133	1.201	1.267	1.334	1.390	1.442	1.487	1.568	1.639	1.700
55	.691	.720	.758	.812	.857	.897	.965	1.020	1.069	1.111	1.184	1.245	1.311	1.369	1.420	1.466	1.546	1.617	1.678
60	.669	.698	.736	.790	.835	.875	.943	.998	1.046	1.089	1.161	1.224	1.290	1.346	1.398	1.444	1.524	1.595	1.656
65	.647	.676	.714	.768	.813	.853	.921	.976	1.023	1.067	1.141	1.201	1.267	1.325	1.376	1.421	1.502	1.573	1.634
70	.625	.654	.692	.746	.791	.831	.899	.954	1.003	1.046	1.119	1.179	1.245	1.303	1.354	1.400	1.480	1.551	1.612
75	.603	.632	.670	.724	.769	.809	.877	.932	.981	1.023	1.097	1.157	1.224	1.280	1.332	1.377	1.458	1.529	1.590
80	.581	.610	.648	.702	.747	.787	.855	.910	.959	1.001	1.075	1.135	1.201	1.259	1.310	1.356	1.436	1.507	1.568
85	.559	.588	.626	.679	.725	.765	.833	.888	.937	.979	1.053	1.113	1.180	1.236	1.288	1.334	1.414	1.485	1.546
90	.537	.566	.604	.657	.703	.743	.811	.866	.914	.957	1.031	1.091	1.157	1.215	1.266	1.311	1.392	1.463	1.524
100	.493	.522	.560	.613	.659	.691	.767	.822	.871	.913	.986	1.047	1.114	1.170	1.222	1.268	1.348	1.419	1.480
110	.449	.478	.516	.569	.615	.656	.723	.778	.827	.869	.942	1.003	1.070	1.126	1.177	1.224	1.304	1.375	1.436
120	.405	.434	.472	.525	.571	.611	.679	.734	.783	.825	.898	.959	1.025	1.082	1.133	1.180	1.260	1.330	1.392
140	.317	.346	.384	.438	.483	.523	.591	.646	.695	.737	.810	.871	.937	.995	1.045	1.091	1.172	1.242	1.304
160	.229	.259	.296	.350	.395	.435	.503	.558	.607	.649	.721	.783	.849	.907	.957	1.004	1.084	1.154	1.216
180	.141	.169	.208	.262	.307	.347	.414	.470	.519	.561	.633	.695	.762	.817	.869	.915	.996	1.066	1.128
200	.053	.081	.120	.173	.219	.259	.326	.382	.430	.473	.545	.607	.673	.731	.782	.827	.908	.978	1.040

Fig. 18—Coil tables ordinarily are charted for steam. If we use a vapor or hot water boiler we must convert the figures from Fig. 17 by using this table. See text for explanation.

sired velocity for the face area of the heater. *Note that the lower the velocity through the face the higher the temperature rise.* The initial or entering air temperature is shown in the column to the left and the final temperature is given under F. T.

Cond. indicates pounds of condensate or water per hour per square foot face area of heater.

Example: 884 divided by 200 equals 4.42 square feet. This would require a heater 42 × 15 inches (Fig. 15) and referring back to Fig. 17 we

AIR PRESSURE DROP THROUGH HEATER IN INCHES WATER (For 70° F. Air)

Rows Deep	Face Velocity in Feet per Minute								
	200	300	400	500	600	700	800	1000	1200
1	.013	.025	.043	.068	.093	.112	.146	.222	.313
2	.025	.045	.078	.118	.162	.206	.272	.410	.577
3	.038	.071	.118	.177	.240	.218	.407	.620	.870
4	.050	.097	.158	.233	.320	.423	.542	.815	1.143
5	.063	.120	.196	.290	.403	.528	.670	1.010	1.427
6	.075	.142	.230	.340	.480	.618	.795	1.208	1.750

Fig. 19—We appreciate that a resistance is set up by the coil. Just what this resistance is for various velocities through the coil and for different types of coil have been carefully tested and are shown in this table.

find that a 1 row unit would give us a final temperature of 139 degrees and a 2 row unit a final temperature of 175 degrees.

Referring to Fig. 19 for pressure drop through heater in inches of water, we find that our loss would be .013 for the 1 row unit and .025 for the 2 row heater. These losses are relatively low and a much higher pressure drop would be practical. This would increase the velocity and reduce the face area and eliminate the use of such a large, and in our problem awkward, unit.

If we use a 400-foot face velocity our pressure drop would be .043 for a 1 row unit, or .078 for a

FINAL TEMPERATURES AND CONDENSATION

In Lbs. per Hour per Square Foot Face Area of Heater

For Steam at 5 Lbs. Gauge Pressure

Temperature 227°F Latent Heat 961

ENTER. AIR TEMP. °F.	NO. ROWS DEEP	Face Velocity in Feet per Minute (At 70° F.)																	
		200		300		400		500		600		700		800		1000		1200	
		F.T.	Cond.	F.T.	Cond.	F.T.	Cond.	F.T.	Cond.	F.T.	Cond.	F.T.	Cond.	F.T.	Cond.	F.T.	Cond.	F.T.	Cond.
0	1	100	22	83	28	73	33	66	36	59	36	53	42	48	43	42	48	38	51
	2	153	34	129	44	114	51	103	56	94	64	88	69	83	75	74	83	67	91
	3	186	41	159	54	141	63	128	71	117	79	110	87	103	93	94	105	86	116
	4	206	45	179	60	160	72	146	82	136	92	127	100	120	108	109	122	101	137
	5	218	46	193	65	178	79	162	91	151	102	143	112	135	121	123	139	116	156
	6	222	50	203	68	188	84	174	98	165	111	156	122	148	134	136	153	127	171
10	1	106	21	89	27	80	31	72	35	66	37	61	40	56	42	50	45	46	49
	2	156	33	133	43	119	49	108	55	100	61	94	66	89	71	80	79	74	87
	3	188	40	162	51	145	61	131	68	122	76	115	82	109	89	99	100	92	111
	4	207	44	181	58	163	69	149	78	140	88	132	96	125	103	114	117	107	131
	5	218	47	195	62	177	78	164	87	155	98	148	107	139	116	128	133	120	146
	6	223	48	204	65	188	80	176	94	166	106	159	117	153	128	140	148	132	164
20	1	111	20	96	26	86	30	78	33	73	35	68	38	64	40	59	43	55	47
	2	159	31	138	40	124	47	114	53	106	59	101	63	96	68	87	76	81	83
	3	190	38	164	49	149	58	136	65	127	72	121	79	114	85	105	96	99	106
	4	208	42	183	56	166	68	152	78	144	84	136	91	129	98	119	112	112	134
	5	219	45	197	60	180	72	167	83	158	93	150	102	143	111	133	126	125	141
	6	225	46	205	62	190	78	176	89	170	101	162	113	156	122	144	140	136	156
30	1	117	19	102	24	93	28	86	32	80	34	76	36	72	38	67	41	63	44
	2	162	30	142	38	129	44	119	50	112	56	107	60	102	65	94	72	88	79
	3	192	36	169	46	153	56	140	62	132	69	126	75	120	81	111	91	105	101
	4	209	40	186	52	169	65	156	75	148	80	140	87	134	94	125	106	118	119
	5	219	43	198	57	182	68	170	79	161	89	154	97	147	106	137	120	130	134
	6	223	44	206	59	192	73	181	86	175	97	168	106	160	116	148	133	140	149
40	1	122	18	108	23	100	27	93	30	88	32	83	34	80	36	76	39	71	42
	2	166	28	146	36	134	42	125	46	118	53	113	57	109	61	101	68	95	75
	3	193	34	170	44	156	52	144	58	137	65	131	71	126	78	117	87	111	96
	4	210	38	187	48	172	59	160	67	152	74	146	82	139	89	130	101	124	113
	5	219	40	198	54	184	65	173	75	165	84	159	92	151	100	142	114	136	128
	6	223	41	207	56	194	69	183	81	178	92	169	101	163	111	152	126	146	141
50	1	128	16	115	22	107	24	100	28	95	31	91	32	88	34	83	37	80	40
	2	169	27	151	34	139	40	130	46	124	50	119	54	115	58	108	65	103	71
	3	196	32	174	42	160	49	149	55	142	62	138	68	131	72	123	82	117	91
	4	211	36	189	47	175	56	163	64	156	70	149	78	144	84	135	96	129	106
	5	220	38	201	51	186	61	176	71	168	80	161	88	156	95	146	108	140	121
	6	223	39	208	53	195	65	186	76	179	87	171	96	167	106	156	119	149	134
60	1	133	17	121	21	113	24	108	27	103	29	99	31	96	32	91	35	88	38
	2	171	26	156	32	144	38	136	43	130	47	125	51	121	55	114	61	110	67
	3	197	31	177	39	164	47	153	52	146	58	141	64	138	69	129	77	123	86
	4	212	34	192	44	178	53	167	60	160	66	154	74	149	79	140	90	134	101
	5	220	36	202	48	189	58	179	67	172	75	165	83	160	89	151	102	145	114
	6	224	37	209	50	197	62	188	72	181	82	174	90	170	99	160	115	154	128
70	1	139	16	127	19	120	23	115	25	110	27	107	29	104	30	99	33	96	35
	2	175	24	160	30	149	35	141	40	135	44	131	48	127	52	121	57	117	63
	3	199	29	180	37	168	44	158	49	151	55	146	60	142	64	135	73	130	80
	4	213	32	195	42	181	50	170	57	164	64	158	69	153	75	145	85	140	95
	5	220	34	204	45	191	54	182	63	176	71	169	78	164	84	156	96	150	107
	6	224	35	210	47	198	58	190	68	184	77	178	85	173	93	164	106	158	119

Fig. 17—The recirculated air reaches the heat transfer coil at a definite temperature. After passing through the coil this air has a much higher temperature. What the increase is depends on the velocity and the depth of the coil. This table shows these conditions for various velocities, entering air temperatures and type of coil. See text for full explanation.

2 row unit. These losses are not too high for practical application hence we have 884 divided

(*Continued on page* 44)

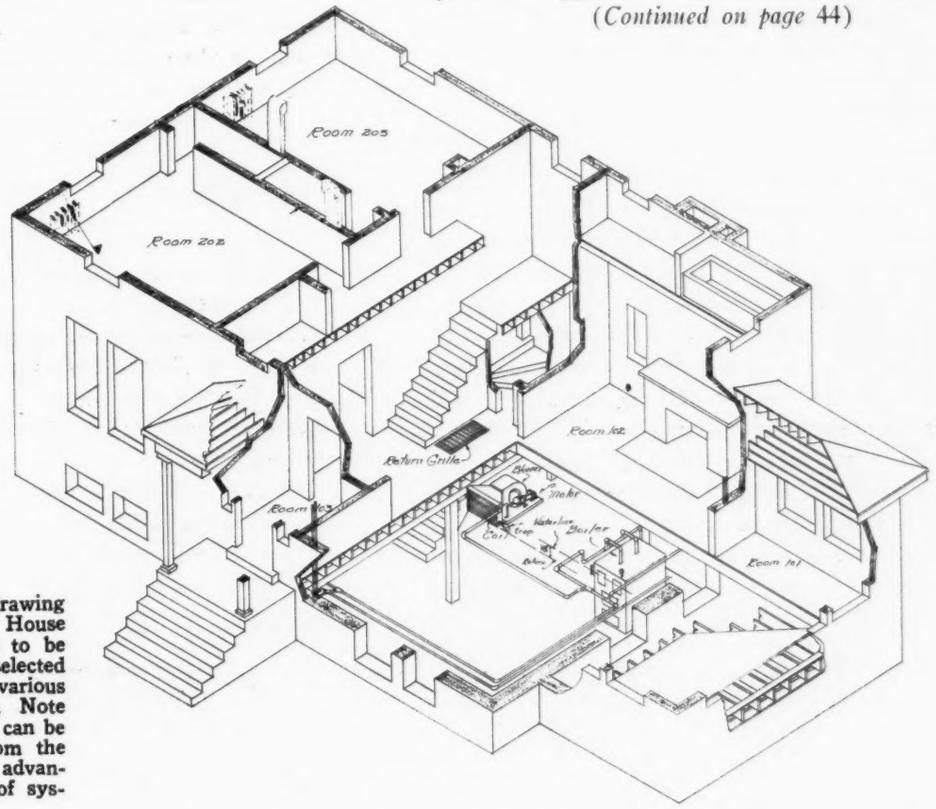


Fig. 20—Cut away drawing of our Example House showing the rooms to be conditioned and a selected location for the various pieces of apparatus. Note that the conditioner can be placed remotely from the boiler, one of the advantages of this type of system.

An Important Consideration in Air Conditioning—

Heat Loss from Basement Pipes

By J. Donald Kroeker

INSUFFICIENT attention has been given to heat loss from conditioned or warm air ducts or pipes. In a furnace installation this heat loss will often amount to 20 per cent of the total heat supplied at the bonnet of the furnace.

To illustrate the effect of neglecting to take this heat loss into account, let us consider a furnace installation in which two rooms, one near the furnace, and one 30 feet farther from the furnace, have room basic factors (if you use the standard code for mechanical warm air heating, otherwise heat loss in thousands of B.t.u. per hour) are 16.0 for each. We want to use register temperatures of 140 degrees F. so the required air delivery for each room is 210 c.f.m. At a velocity of 480 f.p.m. a 9-inch pipe is required for each room. Say now that we use a bare galvanized iron pipe and that the temperature of the air in the basement is 60 degrees.

Under these conditions, when the temperature of the air at the register near the furnace is 140 degrees, the temperature at the one 30 feet farther away will be only 114 degrees. In other words, the effect of the heat loss from the pipe has been to reduce the temperature of the air in it by 26 degrees.

More air has to be supplied to provide the required amount of heat at the register So instead of supplying 210 c.f.m. at this register, we now have to supply $\frac{210\ (140\text{-}70)}{(114\text{-}70)}$ or 334 c.f.m. and the velocity in the 9-inch pipe will have to be $\frac{480 \times 334}{210}$ or 762 f.p.m. instead of 480.

What is usually done after the installation of such a job is to throttle down the pipes to the registers near the furnace and force more air into the long pipe. But by doing this we increased the resistance on the fan considerably because we have to use a velocity of 762 f.p.m. instead of the 480 planned. Consequently, the whole system is out of balance before we start and too much metal has been used in some places and not enough in others. Besides, our fan may be overloaded, or at least the

TABLE 1

Emissivity Coefficients for Tin and Galvanized Iron Ducts

No.	Description of Covering or Surface	Tin	Galvanized Iron
1.	Bare, no insulation.....	1.28	1.33
2.	One thickness of air cell asbestos and one of 10-lb. asbestos paper	0.87	0.90*
3.	Three thickness of ¼-inch air cell asbestos and one of 10-lb. asbestos paper	0.565	0.577
4.	12-lb. asbestos paper, one ply....	2.08	2.10*
5.	12-lb. asbestos paper, two ply....	1.88	1.90*
6.	12-lb. asbestos paper, six ply....	1.39	1.42*
7.	12-lb. asbestos paper, eight ply..	1.26	1.29*

*Estimated by comparison.

Author's Note:—The emissivity coefficients are for duct temperatures. Using the temperature of the air in the duct as the duct temperature introduces a small error which tends to give slightly lower values for final temperature difference than actually obtains. The difference amounts to only a few per cent and is on the side of safety. Values of emissivity on the basis required for heating work are not available.

power consumption of the motor is probably doubled.

The amount of the reduction in temperature due to heat loss from the pipes into the surrounding space can be calculated and we can tell, before we start determining pipe sizes, approximately what the temperature at each register will be. Then we can find the amount of air in c.f.m. required at each register for the temperature of the air at that point and figure the size pipe that will carry the greater amount of air at the velocity we really intend to use.

Now let us look at this matter of heat loss from pipes. Different types of surfaces and insulations have different "emissivity coefficients," that is, heat emission factors. These are given in the number of B.t.u. transmitted per hour by a surface a square foot in area when the temperature difference between the inside of the surface and the air around it is one degree F. This is discussed in the University of Illinois Engineering Experiment station bulletin No. 117, from which the emissivity coefficients given in Table I are taken.

Heat Loss Formula

The heat loss from any surface listed in Table I may then be found from the formula—

$$L = A \times E \times t_d$$

in which

L is the heat loss in B.t.u. per hour.

A is the area of the surface in sq. feet.

E. is the emissivity coefficient in B.t.u. per hour per sq. ft. per deg. F.

t_d is the average temperature difference.

The average temperature difference is the indeterminate quantity here when we don't know the air temperature except at the furnace.

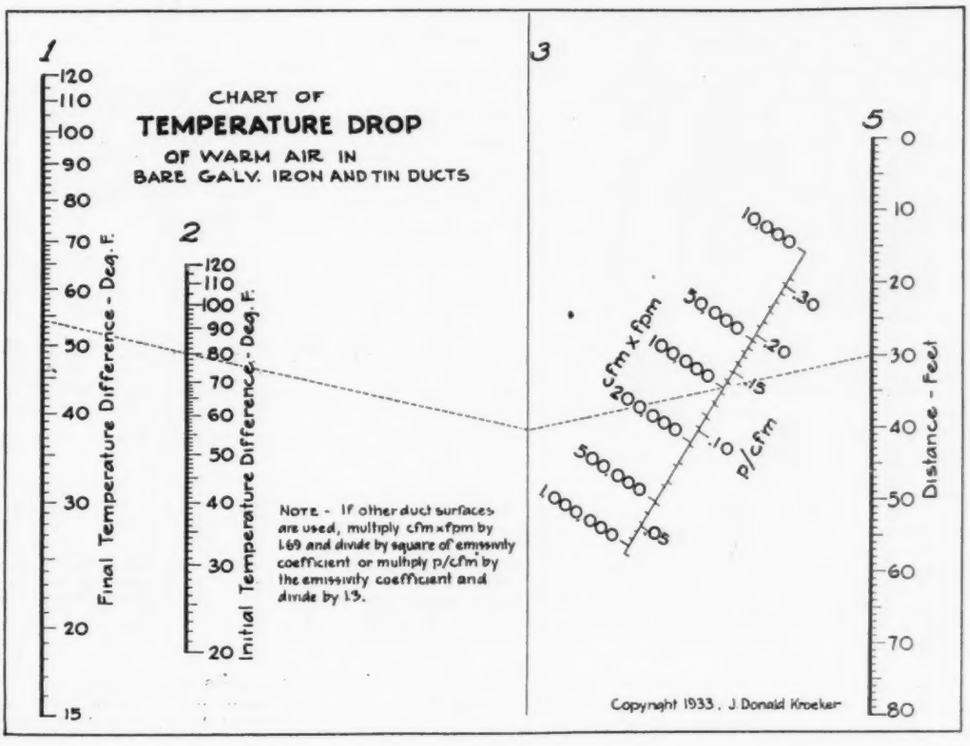
The required temperature at any point in a system may be found, however, with the air temperature at the furnace alone being known, by means of other formulas. But these are so complicated and involved that even accomplished mathematicians require a great deal of time to solve them for each individual case. However, these formulas can be solved very simply and quickly by means of the chart in Fig. 1, "Temperature Drop Chart" for bare galvanized iron and tin warm air ducts.

On this chart we have five scales. The first one is for the final temperature difference between the air inside and outside the duct, the second gives temperature difference at the start or at the furnace, the third one is the diagonal scale and gives values of c.f.m. times f.p.m. on the upper side and of perimeter in inches divided by c.f.m. on the lower side. The last scale is distance in feet.

How to Use Chart

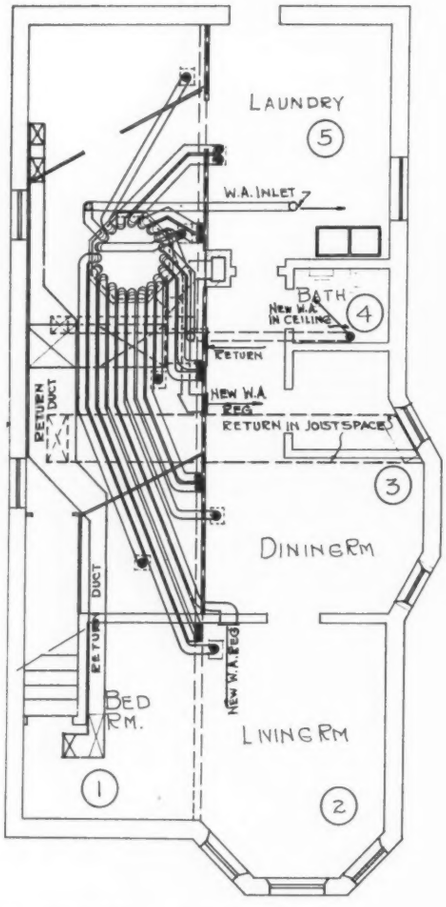
Suppose we have figured the c.f.m on a certain register temperature (according to the code) and we know the velocity in f.p.m. approximately. Also we probably know the distance and the temperature difference at the start. If we use the figures in the example used earlier, we have 210 c.f.m., 480 f.p.m., a distance of 30 feet, and an initial temperature difference of 140 — 60 or 80 degrees. The c.f.m. times f.p.m. required for the diagonal scale is approximately 100,000. Now on scale 5 find the distance, 30 ft.;

(*Continued on page* 40)



The temperature drop chart of Fig. 1 is for bare tin or galvanized iron ducts. If insulated surfaces listed in Table I are used multiply the factor of c.f.m. × f.p.m. by the square of 1.3 and divide by the square of the emissivity coefficient which applies. Or, if you are using factors of p/cfm, divide these by 1.3 and multiply by the emissivity coefficient applicable.

Contractors interested in using this chart may obtain a full sized copy by writing us. —The Editors.



BASEMENT FLOOR PLAN
Ceilings 7'-0"

Field Test Results On Speeded-up Fan Delivery For Cooling In American Artisan Test House No. 1

By Platte Overton

SEVERAL reports of tests have been published on American Artisan test house number 1, which has twenty 6-inch round tin pipe leaders. These reports covering heat supply indicated excellent distribution of air when the fan runs and rather remarkable distribution and flow when the fan is idle and the system operating on gravity.

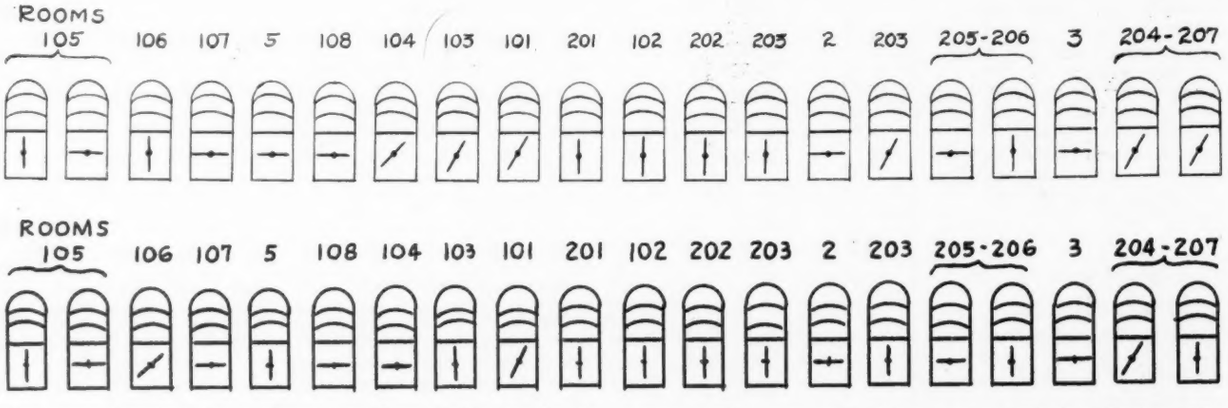
This past summer a number of requests have been made by readers interested in 6-inch pipe systems for data on operation of the plant during the summer with the fan speeded up to give several more air changes per hour and greater c.f.m. delivery at registers.

Readers seemed inclined to believe that due to the fact that most of the 6-inch pipes were carrying velocities around 800 f.p.m. it might be difficult to push any more air through the pipes without burning up the motor, setting up too much noise or actually reaching the place where more air physically could not be forced through.

This speculation on the part of readers made the testing staff wonder just what are the limitations of the 6-inch pipe system for summer air circulation. Accordingly a field test was run in which the fan was speeded up and results read with the anemometer for air flow and with a draft gage for resistances. While not conclusive, due to the fact that smaller pulleys were not available, the test did show some surprising facts.

Damper Settings

First of all a word about pipe dampers. One of the drawings shows the damper settings as they were at the time the heating season tests were reported. Some changes were made—principally to the effect of cutting off some rooms which had no reason for having increased circulation in the summer time. The damper settings as they were during this last test are also shown in a second drawing. It might be added that when a damper was shut down no air showed at the register, indicating good control.



The upper drawing shows damper settings during the heating season while tests were being run on this installation. The lower drawing shows damper settings when the speeded-up fan tests were run this summer. Note how some double pipes were cut off while other runs to rooms not being ventilated were shut off completely.

AIR CONDITIONING CONTROLS

for

Domestic or Commercial Installations

The Humidistat. Very accurate, with exceptionally small differential. Range 20 to 80 per cent relative humidity . . .

MINNEAPOLIS-HONEYWELL Air Conditioning Controls govern all phases of this work, including heating, cooling, ventilating, humidifying or dehumidifying. There are controls for every application, each designed to accomplish its particular function with characteristic Minneapolis-Honeywell accuracy and efficiency. Minneapolis-Honeywell Regulator Company, 2726 Fourth Avenue South, Minneapolis, Minn. Branch and distributing offices in all principal cities.

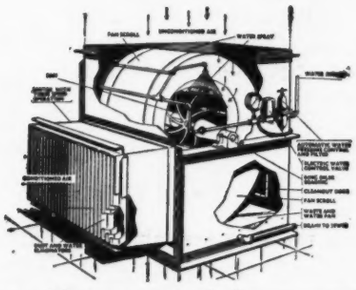
MINNEAPOLIS-HONEYWELL

Control Systems

AM-PE-CO AIR WASHER-BLOWER

Washer-Blower in ONE Unit

—at single-unit cost



—4 years of proven superiority on actual jobs

90% Greater Actual Cleaning Efficiency

New exclusive Am-Pe-Co *"double washing"* feature cleans air *twice* — first as it passes through the sprays, then scrubs it in its vortical movement through the scroll. Tests show almost 90% greater cleaning efficiency. You get BOTH forced air and air conditioner in ONE unit. Saves cost, saves space, makes better job than ordinary double installations. Investigate.

Send for detailed literature and dealer prices.

AMERICAN MACHINE PRODUCTS CO.
Marshalltown, Ia.

Profitable FANS for furnace dealers

The FURNACE FAN

Here are two fans which every furnace dealer can sell at a substantial profit!

Buffalo Furnace Fans, for installation on warm air furnaces, have large capacity at comparatively slow speed—thus providing QUIET efficient air circulation. The fans were designed specially for the work—they are sturdy—easy to install—require no servicing.

The ACE COAL BURNER

This little blower may be sold for hot air, steam or hot water furnaces. It permits burning of the fine grades of hard coal, such as buckwheat and rice, and installed with the ACE Thermostat, provides automatic regulation of heat. Furnace dealers installing these fans make a substantial profit on every sale.

Complete data on both fans in bulletin form sent on request. Ask for Bulletins No. 2907 and 2912.

See Our Exhibit at the Eleventh National Exposition of Power & Mechanical Engineering, Grand Central Palace, New York December 3rd to 8th, 1934

Buffalo Forge Company

497 Broadway Buffalo, N.Y.

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DATA SHEET FOR HEATING SEASON

Room Number	C.F.M.	Velocity
101	130	662
102	128	651
103	132	667
105	161	820
106	115	585

TEST NUMBER 1

(Static Pressure Loss in Boot—.155)

Room Number	C.F.M.	Velocity
5	196	1095
105	179	278
103	153	236
102	59	90
101	117	220
106	33	50

TEST NUMBER 2

(Static Pressure Loss in Boot—.21)

Room Number	C.F.M.	Velocity
5	425	2165
105	195	300
106	52	80
103	156	240
102	68	104
101	114	234

TEST NUMBER 3

(Readings taken in pipe mouth in register box)

Room Number	C.F.M.	Velocity
5	no test	no test
105	252	1284
106	52	264
103	179	914
102	84	426
101	127	646

The c.f.m. shown on the data sheet was taken from the test on January 30th. It will be observed that room 105 was supplied with 161 c.f.m at 148°+ inlet temperature. The fan was operating at 460 R.p.m. and the static pressure loss was .05 inches at the discharge side of the fan.

A six-inch pipe is equal to .1964 square feet hence the pipe velocity was 161 divided by .1964 equals 820 feet per minute approximately.

Two Test Results

For the first test this past summer the blower was speeded up to 625 R.p.m. The c.f.m. obtained at the register in room 105 was 179 or 179 divided by .1964 equals 910+ feet per min. in the pipe. The pressure loss amounted to .155 inches of water. This is an increase of a little more than 10% in the air supply obtained, with an increase of 310% in the pressure loss. See table above for register velocity.

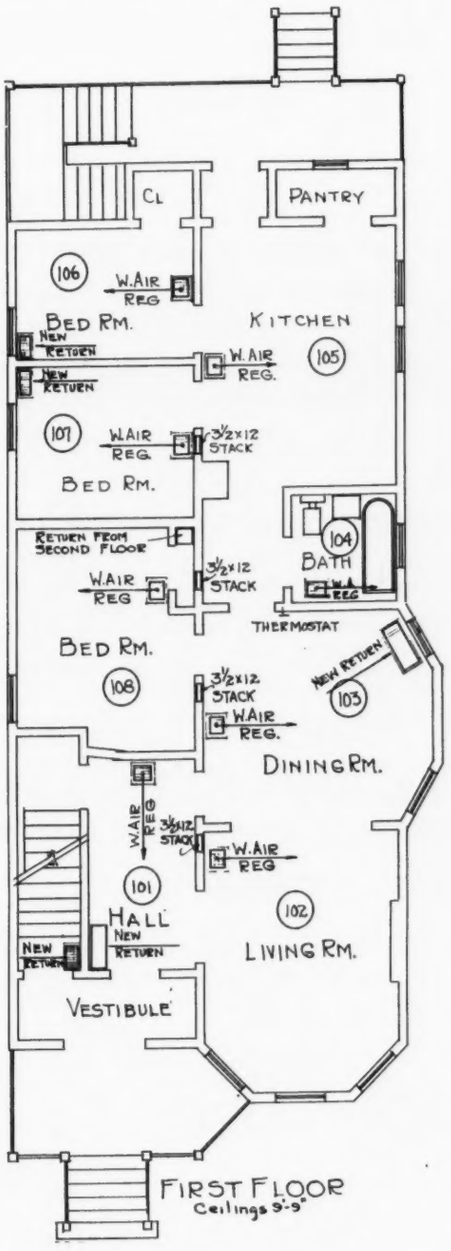
For the second test the fan speed was increased to 730 R.p.m. and the air delivered to room 105 was 195 c.f.m. at the register. 195 divided by .1964 equals about 1,000 feet per minute velocity in the 6-inch pipe and an increase in the air supply of about 21 per cent. The pressure loss was .21, or an increase of about 420 per cent over the original .05 loss with a blower speed of 460 R.p.m.

When we speak of 400% increase in the resistance we must not confuse this with the power con-

sumption. The power consumption is more or less proportional to the air supply and 20 per cent in the power consumption would be nearer the mark. 400 per cent sounds alarmingly high, but even .21 pressure loss is not abnormal.

Room 105 contains 1,755 cubic feet of space and 1,755 divided by 161 is equal to about an 11-minute air change. .179 c.f.m. is equal to about an 9.8 minute air change, and 195 c.f.m. is equal to a 9-minute air change approximately.

That these slight differences would make any perceptible effect in the air cooling of the room is extremely doubtful, unless one were to stand directly over the register. The term "air change" is a misnomer because practically no room, unless de-



First floor plan showing rooms in which air delivery tests were made.

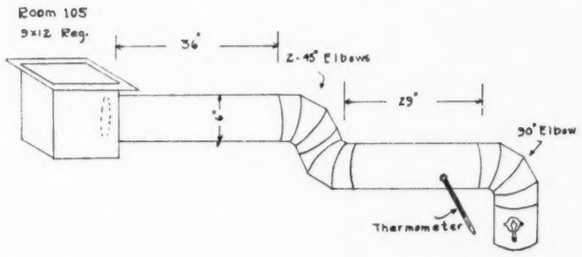
signed for the purpose, has a complete change of air in any given time of regular intervals.

Register Box Effect

However, with the proper design of a 6-inch pipe system greater air delivery than that obtained is possible. The detailed sketch of the run discussed in this article shows the register is one of the old fashioned type with about 40% free area opening and the box and elbows as shown in the cut speak for themselves. With longer sweep elbows, good register head design and more free opening in the register, 2,000 foot velocities in 6-inch pipes are possible and practical. This is equivalent to about 400 c.f.m. Such a volume of air forced into the average room of the average home will have a cooling effect. That is if we use cooler basement air. Two six-inch pipes would be better and such double runs are inexpensive. There are two six-inch runs to the box in room 105, but only one was used in the test.

Test Results

Tests were made in rooms 5-101-102-103-105 and 106. From the data sheet it will be observed that room 101 received less air supply with the



Sketch showing leader run to room 105 and construction of the register box. Pipe is cut directly into the side of the box—not a recommended practice, but necessary in this job. Where two pipes serve a box, as shown in the damper setting sketch, both pipes are cut into either the side or the bottom of the box.

higher fan speed. In rechecking this item the volume damper was found to be slightly loose and the added velocity had a tendency to close it off.

High Velocities

The contractor or designer who is doubtful about the practical application of high velocities in 6-inch pipes may be assured that they will carry the air if the system is well designed and installed. .21 inches of pressure drop is not abnormally high for any kind of cooling service. Compared with mechanical refrigeration or deep well cold water cooling with coils, .21 inches of loss is low. Losses may only be termed high or expensive with say 1,500 to 3,000 feet of air if they exceed ⅜ to ½ inches of loss.

Keep in mind that the power consumption depends more on the volume of air used than the static pressure loss.

Basement Pipe Heat Loss

(*Continued from page* 33)

and on the diagonal scale locate c.f.m. × f.p.m. = 100,000. Lay a straight edge across these two points and mark where it crosses 3, the next vertical line. Then find 80 degrees, the initial temperature difference on scale 2. Align this with the point marked on scale 3 and read the final temperature difference on scale 1. To this figure add the basement temperature used and you have the air temperature required; namely, 114 degrees.

In making a heating layout it is simpler and saving of time to determine the points in the ducts at which the air temperature is successively five degrees less and then determine the air volume in c.f.m. for each register from the nearest known temperature point.

To do this, work the chart backwards, beginning with the final temperature difference and ending with distance. Let us say we want to know the distance in which the temperature drop is 10 degrees when the air temperature at the start is 140 degrees, the basement temperature is 60 degrees, and

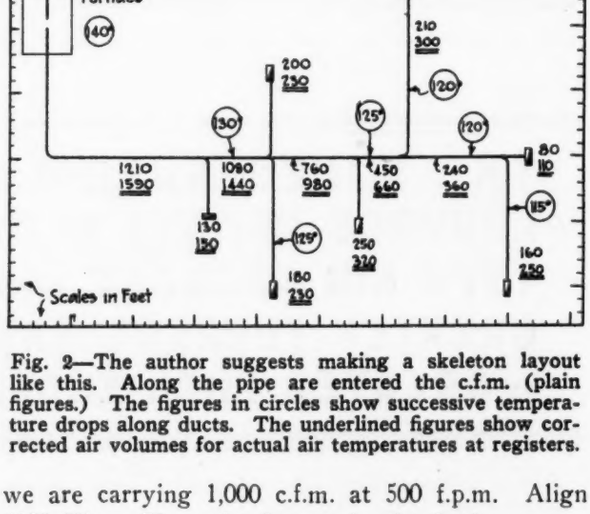


Fig. 2—The author suggests making a skeleton layout like this. Along the pipe are entered the c.f.m. (plain figures.) The figures in circles show successive temperature drops along ducts. The underlined figures show corrected air volumes for actual air temperatures at registers.

we are carrying 1,000 c.f.m. at 500 f.p.m. Align (130-60) or 70 on the first scale, the final temperature difference, with (140-60) or 80, the initial temperature difference, on the second scale and get a point on scale 3. Hold this and align it with c.f.m. × f.p.m. 500,000, on the diagonal scale, and read the last scale; namely, 22 feet.

To show just in what part of the design process to make the corrections for temperature drop, let us follow through the steps required in making any forced air heating layout.

First: We find the room basic factor or the heat loss. (Mechanical Code.)

Second: We determine the amount of air in

c.f.m. required in each room at a certain register temperature, say 140 degrees. According to the code we do this by multiplying the room basic factor by 12.3.

Third: We find the register area required from section 8 (a), second edition of the code.

Fourth: We decide on the size, number, and approximate locations of the registers in each room.

Fifth: We make a skeleton layout of the piping system we plan to use, indicating the amount of air to be carried in each section.

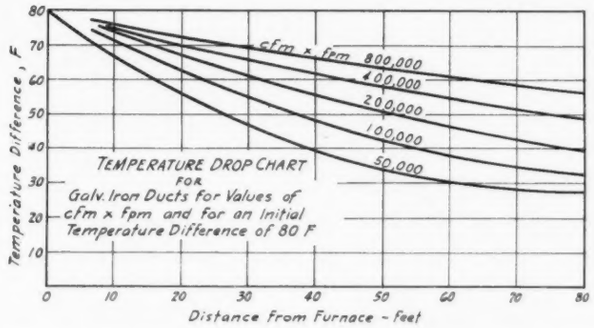


Fig. 3—The factor c.f.m. times f.p.m. used in Fig. 1 for galvanized iron ducts has been plotted here for temperature differences and distance from furnace.

Sixth: Now we should make the corrections in c.f.m. for temperature drop.

Seventh: We should recalculate the air volumes in c.f.m. from the new air temperatures and indicate them on the skeleton.

Eighth: We find the sizes of the various branches and trunks from the corrected air volumes.

Say that in the fifth step we have made the skeleton layout shown in Fig. 2 and have indicated the air volume in c.f.m. to be carried in each section from figures obtained in the second step, and that we plan to use a velocity of 700 f.p.m.

We now have all the information necessary to find the points in the ducts at which the temperature is successively five degrees less. In Fig. 2 these points and their temperatures have been indicated in circles.

Now we can figure the corrected air volumes as stated in the seventh step. These are shown underlined in Fig. 2.

Only two steps have been added to the usual procedure in order to make the necessary corrections for temperature drop.

In the temperature drop chart on Fig. 1, the scale for c.f.m. × f.p.m. gives fully accurate results only for round ducts, but sufficiently accurate results also for rectangular ducts to satisfy usual requirements.

Night Air Cooling

(*Continued from page 27*)

fan installation has over any other method of night air cooling are as follows:

1. The fan may be used for summer as well as for winter service.
2. The problem of noise reduction is much simpler, although excessive fan speeds and air velocities will still transmit noise into the house.
3. The use of filters above the fan inlet will to a certain extent keep out the dust from the house, although they will not keep out the dust brought in by the wind through the open windows. Where complete filtration is desired

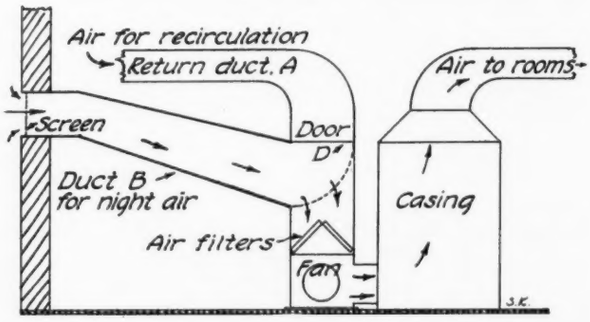


Fig. 5—Diagram of duct arrangements for night cooling in a basement fan, forced air system. Note by-pass for taking in outside air (a highly essential part of the system).

of all the air entering the house, the windows should be kept closed and the air from the rooms allowed to escape up into the attic.

4. The volume of air to be circulated in any room is under control and can be regulated either by dampers in the line or by register dampers.
5. Rooms that have their windows locked can still be cooled to some extent as long as the air from the registers has an opportunity to escape from the room.
6. Arrangements can be made to recirculate the air in the house during the daytime to secure some amount of air movement in the house. In the case of an installation similar to Fig. 5, this can be done by swinging the door, D, downward to block off duct B during the daytime.

The obvious disadvantage of the forced-air system when used for night cooling purposes is that the resistance of the duct system to the flow of air is an appreciable quantity, and the air circulation possible is very much below the quantities possible in an attic fan installation with the same energy input to the motor. On this account, it is distinctly desirable to make the fresh air intake duct large in size and short in length so that the inlet duct re-

sistance is of minimum value. It is possible to entirely dispense with the fresh air intake duct and to take air directly from the outdoors through the open basement window.

Since the ordinary forced-air system as used for winter heating circulates from four to eight air changes per hour, it will be necessary for summer night cooling work to make provisions for speeding up the fan. The increase in air volume that is possible by speeding up the fan is usually limited by the capacity of the motor to take the excess load and by the amount of noise created by the fan and motor. It is desirable, therefore, in selecting fans for forced-air work, to take into consideration not only the winter heating duty of the fan but also the summer cooling duties.

In installations where additional air moving capacity is desired, it is possible to use as an adjunct to method 4 other means of moving air such as those discussed under method 2 and method 3. The possibilities of varying the installation to meet special demands are numerous and the particular installation suitable for any residence is a matter to be decided by the installer.

How Can the Units Be Controlled?

The simplest method of control, aside from manual operation, is that which utilizes a normal 110-volt time-switch to start and to stop the fan. For small capacity motors up to approximately ¼-h.p., it would be possible to connect the time switch directly into the fan circuit. For motors having a rating exceeding approximately ¼-h.p., it would be desirable to connect the time switch into a relay circuit, which in turn is connected to the fan motor. The time switch should be set so that the night cooling fan would be turned on at approximately 6 p. m. and would be turned off at approximately 6 a. m. It is necessary in control arrangements of this nature to provide for manually operated push-button controls, to allow the home-owner to start and to stop the fan at any time.

Until that millenium is reached, when every house is completely air conditioned, and artificially cooled in the summer time, the efforts of the installer and manufacturer can well be directed towards installing residential night air cooling systems. It is quite evident that the method of installation, as much as the particular unit selected to do the work, is of greatest importance in the matter of giving the home-owner a quietly operating and efficient plan. It is to be understood that night air cooling is not in itself a summer air conditioning unit. It will not cool houses down on those warm nights when the minimum outdoor air temperature is above 78 deg. It will not prevent houses from becoming heated up past the comfort temperature, on very hot days.

Radiator Heated Houses

(*Continued from page* 31)

by 400 equals a unit with 2.21 square feet face area or a unit .24 × 15 inches (Fig. 15).

Again referring to Fig. 17 under 400 face velocity and 70 degree entering air we find that a 1-row unit will give us a final temperature of 120 degrees and a 2-row 149 degrees.

Conversion Problem

This is based on 5 pounds of steam pressure, hence we must use the conversion table in Fig. 18 to determine the final temperature with 0 (Zero) degrees pressure and steam at 212 degrees.

Example: Using 5 pounds pressure and 0° entering air with a velocity of 400 feet per minute, (Fig. 17), a 2-row unit will have a final temperature of 114 degrees or a temperature rise of 0 to 114 equals 114.

For 0 pounds pressure and 70 degree entering air temperature, this same unit would give a final temperature rise of .625 times 114 or 71.25 or 70 plus 71.25 equals 141.25 final temperature.

At various times the pressure will be less than atmospheric as the boiler will be generating steam on vacuum and the final temperature will be less, but during the firing up periods when the thermostat is calling for heat we may depend on pressures at atmosphere or above, 212 degrees of steam and a temperature in the plenum chamber of 140 degrees.

Selecting the Blower

The next piece of apparatus for our consideration is the blower. This may be selected from any manufacturer's catalog, and our requirement is a blower to deliver 884 c.f.m. against the pressure loss. This pressure loss is assumed to be ⅜ inches of water. This is the sum of the losses through the heater, filter, supply and return air ducts and a loss through the register face.

These are: for the heater .078, the filter .05, for the supply ducts .10, for the return ducts .05 equals .078 + .05 + .10 + .05 = .278 inches. As we plan to use a register face or grille with small openings and high velocities which will incur a pressure loss we will add this assumed loss of .03 and we have .278 + .03 = .038 inches or ⅜ inches approximately.

Fig. 20 shows the location of the coil and blower. Various sections and cross sections are shown with heights, widths and the steam connection and return from the heat transfer unit. The platform on which the fan rests will be supported from the floor on 4 by 4's and the space below utilized for cooling apparatus to be installed and discussed later. The bottom connection to the main is for the future connection from the cooling coils.

It may be that this discussion of proper methods of selecting the heat transfer coil has been condensed too much for readers who have never done work of this kind. If so we shall be glad to answer your questions or incorporate additional information in future articles. Write us and state your questions.

FOR GETTING BUSINESS

created by the National Housing Act

WE ARE CO-OPERATING with BETTER HOUSING PROGRAM

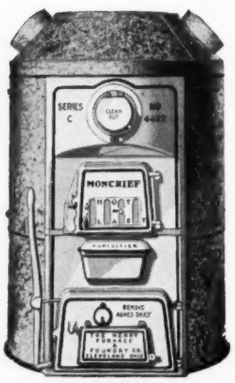
MONCRIEF DEALERS enjoy every advantage

THE replacement market for furnaces is immense; and the National Housing Act is putting money in home owners' pockets so they can buy.

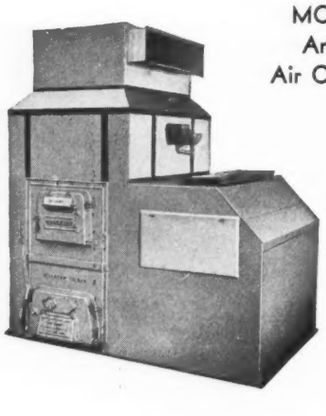
No dealer is better situated than a Moncrief Dealer to take advantage of this great opportunity. Our special finance plan is devised to cut out all red tape and cut down sales resistance to the home owner's signing the order. No other dealer can offer more than the Moncrief Dealer.

All that you, a Moncrief Dealer, require of your customer is to fill out the regular Government application blank, sign a note, which you endorse WITHOUT RECOURSE, and get a report on him from a reputable financial agency. You incur no obligation whatever and when the job is done, you get paid in full.

In our complete line of Moncrief Furnaces and air conditioning equipment, we have something you can sell and install all winter long. It gives you a real chance to make money. Write for details of our interesting proposition.



MONCRIEF
Series "C"
Cast Furnace



MONCRIEF
Aristocrat
Air Conditioner

THE HENRY FURNACE & FOUNDRY CO.

3471 East 49th St., Cleveland, O.

We supply everything used on a warm air heating job. Cast Furnaces — Steel Furnaces — Pipe and Fittings — Air Conditioning Systems — Miles Junior Air Conditioner

An American Artisan Survey

Code Authority Committee Reports

The accomplishments of code authority committees vitally concern every contractor in the industry. Many important problems must be worked out and cooperation between committees is helpful. This section records the latest operations of typical committees. Your reports are invited.

Western Washington

(Reported by Robert W. Larson, Executive Secretary)

The Code was made effective as far as bid depositories were concerned in this district on June 11th and the election of Local and District Code Authorities was completed on June 22nd with the exception of a local code authority for the Olympia Division which has as yet not been completed.

On Wedneesday, Oct. 10th, a special meeting of the Western District Code Authority was held. They recommended to all local code authorities that the bid depository fees be increased to twenty-five cents and that a stamp system be put into effect having a different stamp for each of the six local code authority divisions, this to become effective Nov. 15th.

The Local Code Authority of the Seattle Division met on Oct. 16th and they ordered that the bid depository fee be increased as follows: 25c on bids of $50 to $500, 50c on bids from $501 to $1,000, 75c on bids from $1,001 to $2,000, and $1.00 for bids over $2,001.

A number of meetings were held in the Seattle Division to arrive at a fair average overhead for each branch of the industry. On Sept. 25th, a petition was sent to the National Code Authority through D. A. Jackson's office, Zone Representative at Los Angeles, requesting the National Code Authority and the Administrator to approve the following average overhead mark-ups which in the general sheet metal, ventilation, and kitchen equipment, built-up roofing and steep roofing (shingles) consisted of labor and material and certain direct job expense composed of transportation of men to and from work, freight and cartage, drafting, staging, etc. less salvage (if any) municipal permits and inspection fees, occupation tax, public liability insurance, industrial insurance, incidental expense, code authority fees. These items amounted to approximately 12½% of the cost of labor and material. While it is true that some branches of the industry, above mentioned, did not have some of these items, other branches did. Nevertheless, the average of 12½% prevailed.

In addition to the above mentioned direct job expense items, the petition stated that the desired average mark-up for general sheet metal, kitchen equipment and ventilation was 33⅓%; built-up roofing, 25%; steep roofing (shingles) 19%.

On furnace work, slate, clay tile, and rigid asbestos shingles, the direct job expense applying to the other branches does not exist and the contractors of these branches agreed that a fair average overhead mark-up would be as follows: furnace contracting, 40% on cost of labor and material; slate, clay tile, and rigid asbestos shingles, 17%.

At the meeting of Oct. 10th, the Western District Code Authority instructed all local code authorities (with the exception of Seattle and Tacoma who had already had meetings on average overhead mark-ups) to hold meetings to determine what they would consider to be a fair average percentage.

Without an average overhead being approved by the National Code Authority and the Administrator for this district, the Code has no real value to members of this industry except by the depository system which stops chiseling by members of the industry and the customer.

It is the universal feeling of the members in this district that unless an average overhead mark-up for the various branches is approved, the Code is doomed to failure. Unless the Codes accomplish something for the benefit of the contractor as well as for labor, it is not equitable nor is it a code of fair competition unless all members of the industry work on the same basis.

Boston, Massachusetts

(Report by John F. Walsh, Executive Secretary)

The Roofing and Sheet Metal Contracting Code Authority for Metropolitan Boston has established the United States Trust Company, 40 Court Street, Boston, as the approved bid depository in the trade area covered by some forty cities and towns in the Metropolitan Boston area.

Filing of bids was made effective October 10, 1934. All bidders on any job in the Metropolitan Boston area based on awarding authorities plans and specifications in the amount of $300 or over, or where a bid is made on a set of awarding authorities specifications and for work on an existing structure in the amount of $300 or over, must file a sealed copy of each bid and any revisions thereof with the authorized bid depository.

Each bidder filing identical bids with several general contractors must file one copy of his bid with the bid depository and shall list on the copy the names of all contractors, owners or agents to whom the bid has been submitted. Each bidder shall indicate in his proposal to the bid taker that a copy of the quotation in a sealed envelope has been delivered to the designated bid depository. Bidders must keep a record and itemized estimate in their offices of all bids submitted.

A closing time for bids has been set by the awarding authority to the effect that sub-contractors must have their bids in the hands of general contractor, owner or agent at least twenty-four hours prior to the time set for opening bids. Copy of the bid must be mailed to the bid depository and bear a postmark not later than 12 o'clock of the night before the day the bid is required by the contractor, owner or agent.

A depository bid fee of 25c must accompany each bid.

Upon receipt of authentic information that the award has been made, the code authority secretary may, on the request and in the presence of any bidder on this particular job, open and make known the amounts of the various bids.

A Long Sweep Blower Elbow

By
L. F. Hyatt
Contributing Editor

THE long sweep blower elbow problem submitted by a Michigan reader of the AMERICAN ARTISAN is accompanied by a letter asking how these patterns are developed, how the miter lines are found and the procedure in locating the rivet holes.

This problem is especially interesting since it is to be made of heavy gauge metal, thus necessitating the tapering of each piece to fit into the piece to be riveted to it.

To draw the elevation view, Fig. 1, first draw the right angle *A-B-C*. Then draw the two arcs representing the throat and the heel. Now divide the heel arc into equal spaces —one less in number than the number of pieces desired in the elbow. Number as shown. In this case the arc is divided into 15 equal spaces.

Next take any length radius, as *R*, and with 1 and 2 as centers strike arcs intersecting each other at *o*. Now from the point of intersection *o* draw a line to *B*. Continue by striking arcs with like radii using points 2 and 3 as centers locating point *n* and draw a line as before, to point *B*. Continue until all the miter lines for the 16 pieces in the elbow have been completed.

This rule applies to heavy or light gauge elbows and to elbows having any number of pieces. Now draw the straight lines describing the outline of the elevation view. The first lines are drawn vertical as shown, from the mean diameter until they strike the miter line drawn from *o*. From this point of intersection draw a straight line tangent to the heel arc so as to intersect the miter line drawn from *n*.

The same is done on the throat side of the elbow. It is important that these lines be drawn carefully. It will be noted that all pieces of the elbow taper in the direction of the arrow as shown on Fig. 1. The patterns and the elevation views have been taken from a drawing one-fourth the actual size.

The allowance for the taper of the section has been used full size, ½ of three times the thickness of the metal, which is $\frac{3}{16}$ on each end of the pattern. This is of course greatly enlarged, and was done so as to show the method more clearly. In reality this should have been scaled down to the same proportion as the other drawings. This of course shows the ends of each pattern sloping far more than will be the case.

It is necessary to find a true girth diagram before beginning the development of the patterns. Begin this by first drawing the horizontal line *A-B*. Upon this line step off the distances 1, 2, 3, 4, etc., found on the mean diameter circle, Fig. 1. (The elevation view in Fig. 1 is greatly reduced to conserve space.)

Next step off the distances 7 to *m* and 7 to *n*. This distance is ½ of 3 times the thickness of the metal used, or $\frac{3}{16}$-inch in this case. Now with *A-m* as a radius strike an arc of indefinite length. Erect a perpendicular line from point 7, allowing it to intersect the arc just drawn at 7′. Draw a line from 1′ to 7′ as shown. Next draw the perpendicular lines from the other points on line *A-B*, thus locating points 2′-3′-4′, etc. These distances are the true girth spaces of the large end of the pipe. Now from point *n* on line *A-B* and 1′ as a center, strike an arc of indefinite length and draw a straight line from point 7 tangent to the arc just drawn. From the point of tangency 7″ draw the line 7″-1′. Then draw lines parallel to 7-7″ from the other points found on the line *A-B*. This gives the half true girth for the small end of the pipe. The distances found here will be used later to develop the patterns.

The elevation views on Fig. 3 are drawn one-fourth the actual size and are the sections indicated by *A, B, P* on Fig. 1. First draw view *A* and draw vertical lines from points 1, 2, 3, 4, etc. Extend the line *w-x* and upon this line step off and number 1′, 2′, 3′, 4′, 5′, 6′, 7′, equal in length to like numbers found on girth diagram for the large end, Fig. 2. Erect a perpendicular line from point 7′. Next draw a horizontal line through point 7″ and upon this line step off 1″, 2″, 3″, 4″, 5″, etc., from the distances for the small girth. Drop lines of indefinite length from each of the points on this line.

Now draw horizontal lines from each point on the miter line of *A* intersecting similarly numbered lines just drawn. The curved line is now drawn through the points of intersection and the allowance for lap, which should never be too great, is added, as shown by the dotted line.

Next draw the elevation view of *B*. Since all the pieces between the two end pieces are exactly alike only one pattern is needed. Draw the lines *L-M* and *N-O* far enough apart to allow for the pattern between. Draw the vertical line 7′-7″. Step off the distances 1′, 2′, 3′, 4′, etc., found on the girth diagram. Erect perpendicular lines of indefinite length from each point on this line. Next step off the distances 1″, 2″, 3″, etc., found on the short girth diagram on *N-O* as shown, and drop lines from each of the points on this line. Now draw horizontal lines from the points on each of the miter lines on *B*, allowing them to intersect the vertical lines of like number, and through the points of intersection draw the two curved lines describing the upper and lower edges of section *B*. Add laps and locate rivet holes.

Next draw the elevation view of section *P*. This is of course exactly like section *A*. Extend the line *n-v* and step off the distances of the short girth 1″, 2″, 3″, 4″, 5″, 6″, 7″ and number. From 7″ draw the perpendicular line 7″-7′. Through point 7′ on this line draw a horizontal line as shown. Upon this line step off the distances as 1″, 2″, 3″, 4″, etc., found on the girth diagram

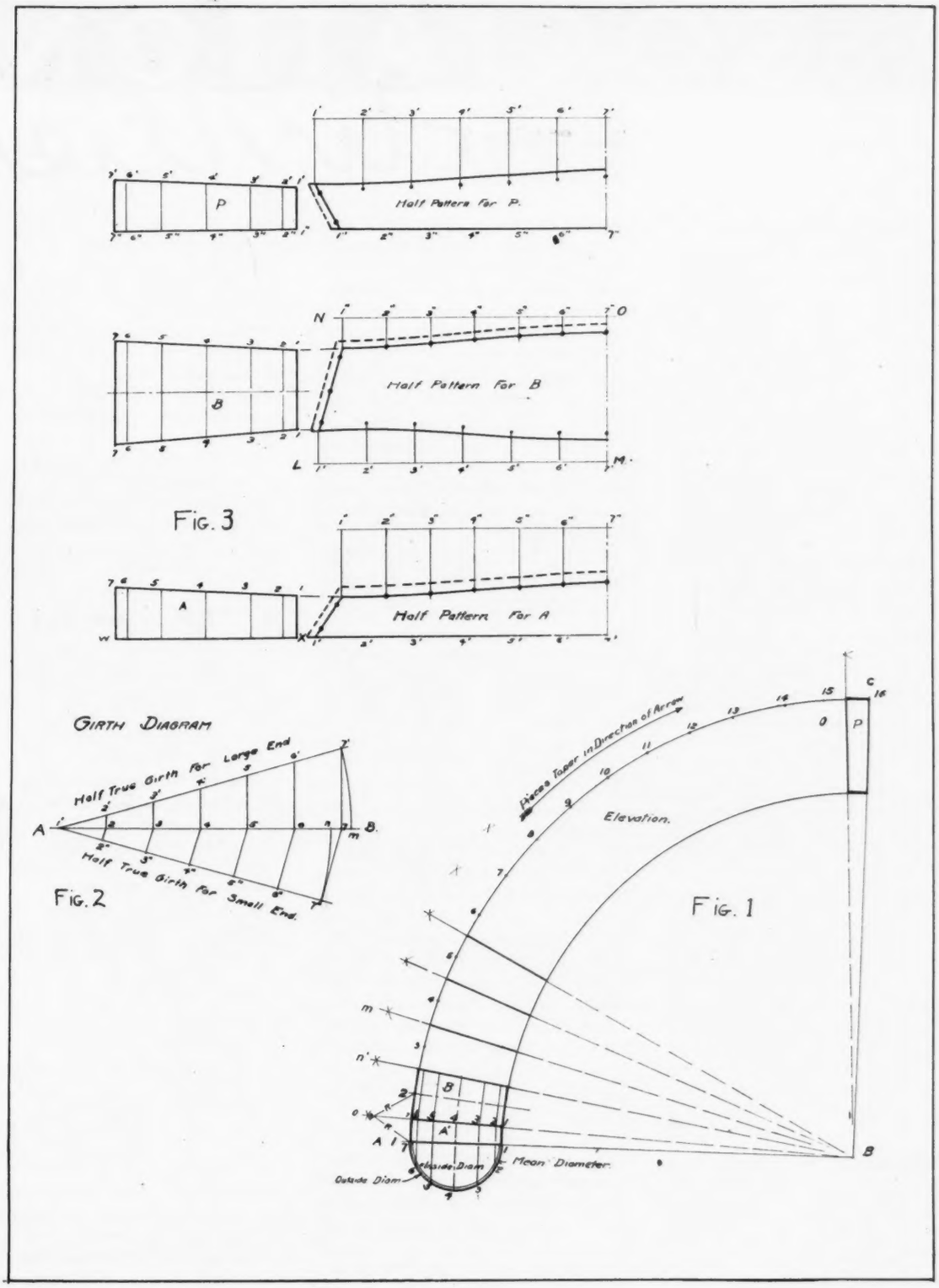


Fig. 3

Fig. 2

Fig. 1

and drop lines of indefinite length from each of these points.

Now from points 1′, 2′, 3′, 4′, 5′, 6′, 7′, on the miter line draw horizontal lines intersecting the vertical lines as was done with each of the other patterns. Through these points draw the curved line and allow the lap on the end. Locate rivet holes along the curved side as shown.

This completes the half patterns necessary for the elbow. For large elbows such as this the patterns are usually drawn one-fourth the actual size, then transferred to the metal four times that size.

The rivet holes are punched along the lower edge of the half pattern for *B* as shown, also along the miter edge of the half pattern for *P*. After the other edges have been flanged and carefully fitted together, the holes are marked in them and punched. Standard practice recommends the use of metal two gauges heavier than is used in the straight pieces of conveyor pipes.

ASSOCIATION Activities

New York State

The New York State Sheet Metal and Roofing Contractors' Association is continuing to maintain monthly contact with members through the mimeographed bulletins prepared in the secretary's office. The contents of these bulletins have been enlarged in scope as, for example, in the October bulletin the association discussed the future of air conditiong work, various free publications available to members, typical prices of mail order furnaces, suggested ways and means of increasing business.

The association is recommending that every member secure from manufacturers such literature as will assist the contractor in increasing his work. The association is actively behind a program to make clear to the entire industry the present status of mail order competition. To this end the October bulletin suggests that contractors are not being fair to themselves and the industry if they continue to buy from manufacturers who are also selling to mail order houses. For purposes of price comparison, the association has published the following table of typical prices of materials as quoted by Sears Roebuck & Company (Table below).

Cast Iron Furnaces	$49.85 with casings
Cast Iron Furnaces, 24 inch pot	89.50 with casings
Steel Brick Lined Furnaces, 22 inch pot	89.95 with casings
7 inch galvanized smokepipe, 26 ga. 24 inches long	.30 per length
6 inch galvanized smokepipe, 26 ga. 24 inches long	.27 per length
8 inch galvanized smokepipe, 26 ga. 24 inches long	.34 per length
9 inch galvanized smokepipe, 26 ga. 24 inches long	.36 per length
10 inch galvanized smokepipe, 26 ga. 24 inches long	.42 per length
7 inch galvanized 90 degree, 26 ga. elbows	.31 each
6 inch galvanized 90 degree, 26 ga. elbows	.27 each
8 inch galvanized 90 degree, 26 ga. elbows	.35 each
9 inch galvanized 90 degree, 26 ga. elbows	.39 each
10 inch galvanized 90 degree, 26 ga. elbows	.45 each
25 pounds asbestos cement	.75 each
7 inch cast dampers	.25 each
8 inch warm air dampers	.18 each

The association proposes to make this educational program on mail order prices a nation-wide undertaking and to this end authentic information on prices and sales methods will be forwarded by the New York Association to a large number of contractors in all parts of the country.

Business throughout New York State in both large towns and small towns is maintaining a volume higher than any previous year in the last five years. The season started earlier and is continuing at an accelerating rate. Members report that forced air heating is finding much favor and that jobs running above $1,000 are quite common.

Adolph Hesse,
Secretary.

Milwaukee, Wisconsin

During October a very important meeting was held by the Milwaukee Association of Sheet Metal Contractors with the local labor union No. 24. The meeting revolved around a discussion on the feasibility of continuing our campaign for the establishment of proper labor regulations according to the code. The association has found it difficult to carry on the necessary work unless considerably larger amounts of money are spent and it was, therefore, decided to hold the matter in abeyance until the entire industry is inclined to take up the organization work.

In Milwaukee, the Better Housing campaign is progressing satisfactorily and the association has undertaken the task of acquainting all members with the provisions of this act and to assist members in securing the largest possible volume of work under the act.

The association has given considerable time and attention to the activities of certain interests who are attempting to divorce slate and tile roofing, also the glazing of metal skylights, from the sheet metal business. The association feels that it has the backing of the NRA and our code and proposes to put forth all the work necessary to retain such contracts under our code and for Milwaukee sheet metal contractors.

Prospects for heating, ventilating and sheet metal work in the Milwaukee area are about the same as 1933, but there is some improvement shown in domestic heating contracts both as to size and volume. The association is hoping that the increased fall business will continue all during the winter.

The association has launched an intensive campaign to convince contractors that the code for our industry is both workable and advantageous.

Paul L. Biersach,
Secretary.

Buffalo, New York

The Buffalo, N. Y., Sheet Metal, Warm Air Heating and Air Conditioning Association holds its regular meetings in the Builders Exchange, Room 220, Delaware Avenue, the first Friday of each month.

The following members have been elected to serve the association as officers:

Leo J. Olear, President
William Gorden, Vice President
Fred Frisch, Secretary
Nick Adema, Treasurer
Norman Pilkey, Financial Secretary

BOARD OF DIRECTORS

William Eisle
Harry Yost
Max Reid
Frank Minet
Barney Cummings
Charles Hall
Elmer Wiegel

Our President, Leo J. Olear, has been elected and approved to serve on the Regional Board of the Sheet Metal and Roofing Code. He represents the warm air heating and air conditioning contractors. The board consists of one representative for warm air heating and air conditioning; one representative for sheet metal contracting and one representative for roofing. This board was elected as the final compliance committee for the Buffalo area. It is proposed that the board, in conjunction with Clarence Meyer, Regional State Code Administrator, will select five inspectors whose duties will be to see that shops comply with labor regulations.

The association has a total of fifty

Association Activities . . . . . .

active members and is taking in new members at every meeting. We want to increase our membership 100 per cent. Committees and officers have been working very hard to better the warm air heating trade and are working to have the Standard Code passed by the City Council and included in our City Building Laws. We have also been working to stop the coal and coke companies from repairing and cleaning furnaces. This endeavor has been very successful.

The passing of the Standard Code as a part of the City Ordinance seems likely at this time and the association later proposes to try and secure adoption of the Mechanical Code to cover forced air work. The association has discovered that many small shops employing no mechanics fail to carry liability insurance and proposes to drive all such contractors into taking out and carrying insurance.

The association, in accordance with fair price practices of the NRA Code, has established a price of $3.00 for cleaning one furnace and $5.00 for cleaning two furnaces. This price includes cleaning the radiator, dome, smoke pipe, oiling of chains and cementing up a feed door. Additional flat rate prices are quoted for warm air and cold air runs; cleaning registers and boxes and recementing the furnace. The Buffalo contractors' group is somewhat concerned over the one per cent assessment for code financing which is awaiting final word from the State Code Compliance Board and the National Board as to whether or not this one per cent assessment is to be continued.

Leo J. Olear,
President.

◆

Ft. Wayne, Ind.

Prospects for heating during the coming winter seem much better than last year, judging from the early fall activities. Money seems to be somewhat easier, collections are better, and for the most part we are able to secure better prices than at this time last year.

As to what this association has done to cooperate with the Federal Housing Act, in this locality those activities were taken up by the Chamber of Commerce rather than by architects or engineers, and the activities seem to be lagging due to that fact. We believe if an architest or an engineer had been placed at the head of this committee we would have been able to secure greater cooperation. Our members believe that F. H. A. under proper leadership, unbiased, would assist us very greatly.

Members in this district have been very enthusiastic over our Code and have been extremely anxious that the setup be perfected whereby enforcement could be made. However, within the last few days, since the assessment statements have been mailed out, there seems to be some little dissatisfaction with the amount of the assessment. Just to what extent this dissatisfaction will carry itself we are unable to say at this time. However, the writer being the Secretary and Executive Manager of the Local Code Administration Board, is of the opinion that this assessment, being levied for the first three months period of the effective date of our Code and being merely a trial assessment, will prove to be a very reasonable assessment. However, the amount of future assessments will depend very largely upon the actual truthful returns made by the members of the industry in response to the first assessment. If the contractors make and send in their returns short of their actual volume of business, this naturally will result in a higher percentage for the next assessment. However, if the contractors want to be honest with themselves and with other members of the industry and make honest returns, no doubt the next assessment will be lowered. This one point alone seems to be the only objection so far in this trade area.

We have not completed up to the present time our set-up as to cost and over-head records for NRA. However, we are endeavoring to compile this data and complete these records for approval of NRA at an early date.

One more item of interest—The registration under NRA within the city of Fort Wayne is about 99%, and about 95% of the membership in the industry are members of the local association. At the present time we have in this district eight organizations out of a possible ten, leaving only two counties who have not at present formed an organization, and we consider this very good. The writer under his duties as Executive Manager for the Local Code Administration Board has just completed the mailing of 310 assessment statements, that number of contractors being known at the present time operating within this district, and we anticipate an increase of possibly 10% in that number when actual returns are available.

Chas. E. Tharp, President.

Wisconsin

At the October meeting of the Wisconsin Sheet Metal Contractors Association Board of Directors meeting, considerable discussion was devoted to possibilities for a program for the annual convention to be held in February. Various suggestions have been considered and a definite program is hoped for by the first of December.

A number of important changes in the Constitution and By-laws are under consideration and full details will be mailed to members shortly.

Paul L. Biersach,
Secretary.

◆

Queens County, New York

At a special meeting held September 24, the following officers were elected for the Kings and Queens County Roofers and Sheet Metal Contractors Association:

President—G. E. Carlson
Vice President—J. Farbstein
Secretary—John F. Grady, Jr.
Treasurer—H. Hofstad
Sergeant-at-Arms—F. Devlin
Directors—H. Baron, W. Marcus, R. Wolf, D. J. Thompson, W. Holt.

John F. Grady, Jr.,
Secretary.

◆

Chicago

The licensing act of the Chicago city ordinance has now been in effect about three months. Under this law every contractor installing or repairing a furnace must take out a permit and stand an inspection.

The cost of taking out a license is $25.00 for the first year and $10.00 for renewal each succeeding year. The Chicago associations have been engaged in lining up every member to take out his license and do up-to-inspection work. So far some fifty firms have taken out licenses and more firms are coming in every week. The associations through their officers have pledged the compliance of every member and plan to have all members licensed shortly.

The legal cost of getting this licensing act into law has been born by voluntary contribution and by money raised at entertainments by the various organizations. The south side associations held a party on October 27 for the purpose of raising their quota. The party brought out some five hundred guests and was a huge success.

The Furnace and Sheet Metal Institute will hold a party for the same purpose on November 30.

New PRODUCTS

For your convenience a number has been assigned each item on this page. A coupon will be found on page 61. Check the items you are interested in and mail the coupon to us. Complete information will be forwarded.

110—Fan Switch

A new type of fan switch is announced by the Russell Electric Company, 342 West Huron Street, Chicago, Illinois.

Two unique features are claimed: (1) It does not project inside the furnace but clamps in intimate contact with the bonnet between two of the warm air outlets. (2) The switch has a small differential.

The manufacturer claims that this switch is the only control necessary for the proper operation of a furnace fan, provided the heating plant is equipped with a regulator set with stack limit control. The stack limit control always keeps the fire under control. It responds instantly to the temperature conditions in the com-

bustion chamber so that heat energy is only released as required and dictated by the room thermostat.

This same switch with pipe straps is recommended as a line or low voltage hot water limit control by clamping to the hot water riser above the boiler.

◆

111—Chimney Vent

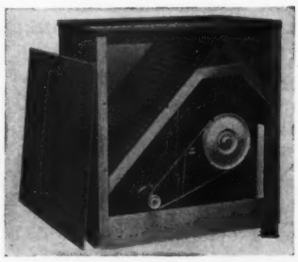
The "Magic" chimney vent, a downdraft eliminator, constructed of galvanized iron, copper, leaded copper, stainless steel or any other workable material, is announced by the Providence Cornice Company, 311 Canal Street, Providence, R. I.

The vent consists of an up-right flue from the chimney which, in turn, opens into a special top and bottom opening and U-passage so that the force of the wind never has a direct action on the flue proper. Smoke can be withdrawn from the top or bottom according to the wind action. Weather is completely sealed out due to the special construction.

A leaflet describing the action of the vent and showing by means of drawings the action of the vent under various wind directions has been prepared.

112—Blower

A new 1,200-cubic foot blower, complete with filters, motor, furnastat, canvas connections, drive and cabinet and large enough to handle 13,000 cubic feet of space or a gravity pipe area of 525 inches, is announced by Lau Heat-



ing Service, Inc., 3116 North Main Street, Dayton, Ohio.

The new blower is designed for sale at a low price. The unit will be furnished in five sizes ranging from 1,200 to 3,200 C. F. M. or a maximum gravity pipe area of from 525 to 1,300 square inches.

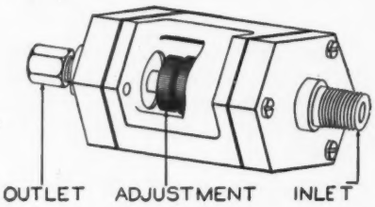
The company announces that the new blower is the result of several years of research in investigating and designing complete blowers for sale at low cost.

Literature showing the unit and describing it in complete detail, together with characteristics, dimensions and prices, is supplied by the company.

◆

113—Water Pressure Governor

A water pressure governor for use in humidifying systems is announced by The Monmouth Products Company of Cleveland. This governor, measuring only 1¼x2 inches, assures delivery of water to air washers, humidifying pans, etc., at uniform pressure



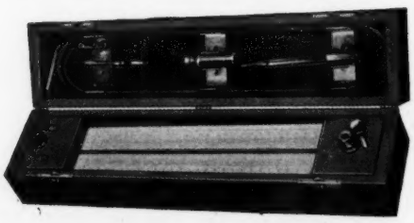
and hence at uniform flow, regardless of pressure fluctuations upon the inlet side.

The delivery pressure of the water may be set so low that much larger orifices or much larger needle valve openings can be employed. Trouble with clogging and non-uniformity of water flow will therefore be eliminated.

114—Air Conditioning Meter

An air conditioning meter, which gives readings in inches of water gage pressure and corresponding velocities is announced by The Firelands Manufacturing Co., 206 Citizens National Bank Building, Norwalk, Ohio.

This meter can be used at registers or in leader pipes or stacks to obtain the cfm, velocity and static pressure loss in the pipes. The meter is scaled to register velocities as low as 140 fpm. Two dials, one reading from 0 to .125 with eight readings of .01 inches and



the second dial from 0 to .50 with four readings of .02 inches, are used to register velocity.

The meter comes in a wooden carrying case with all necessary tubing and tubes, liquid and fittings carried in the lid. The meter is designed for ready application on the job and can be used by any contractor.

Full instructions, with diagrams showing usage, are furnished with each instrument.

◆

115—Holding Device

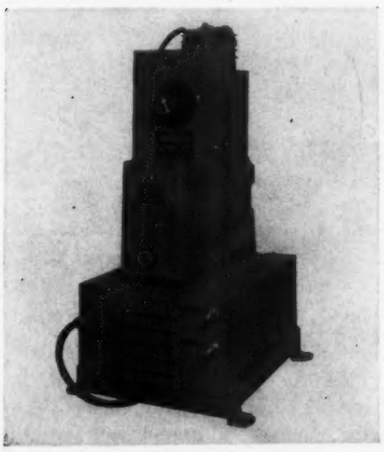
A new expansion bolt called the Rawl-Drive, has just been placed on the market by The Rawlplug Company, Inc., of 98 Lafayette Street, New York.

The new Rawl-Drive is a one-piece device for holding or attaching anything to hard materials such as concrete, brick, stone and other solid masonry. It looks like a bolt and drives in like a nail—has tremendous gripping and holding power—and gives the user the highly desirable advantage of a combination anchor and anchoring device in a single (one-piece) unit. No caulking is necessary; when the Rawl-Drive is driven in with a hammer it is tight—when the Rawl-Drive is driven home it is completely and thoroughly anchored.

A hole is drilled in the material—the fixture put in place—and by a few sharp blows with a hammer the Rawl-Drive is anchored permanently. Tests have shown a ⅜-inch Rawl-Drive will withstand 1,200 lbs. direct pull when embedded in a 1-2-4 concrete and a ½-inch Rawl-Drive in the same concrete will withstand 12,000 lbs. pull.

116—New Welder

An arc welder to be used on thin sheets, plates and shapes by metal-working shops and fabricating plants is announced by The Lincoln Electric Company, Cleveland, Ohio. This new welder can be supplied for use on any alternating current power line including 110 volt circuit.



Since it supplies a uniform current for using electrodes as small as ⅛-inch, this new welder can be employed by metal-working shops and industrial plants on materials as light as 24 gauge.

The new SA 75 welder is of AC motor-driven type employing a 25 volt arc with a current range of 20 to 100 amperes. The generator is of single operator variable voltage type with 75 ampere N. E. M. A. rating. The motor is a 3 horsepower squirrel cage induction type for across-the-line starting. The welder is supplied for alternating current 110 and 550 or special voltages; 3, 2 or 1 phase; 60 and 50 cycles as desired.

◆

117—Recording Instruments

The Practical Instrument Company, 2713 North Ashland Avenue, Chicago, Illinois, has had in production for the past year several models of temperature recorders and operation recorders. These instruments are manufactured in several ranges as, for example, the temperature recorder may be secured with ranges from 30 to 60, 60 to 90, 60 to 120 degrees F. The operation recorder may be obtained for either A. C. or D. C. motors of less than ½ h. p.

Both instruments are built in special light weight fiber cases containing all necessary mechanism. A supply of charts and recording ink is included with each instrument. The temperature recorder may be placed in any room, the clock mechanism wound and will record temperature variations over a period of 24 hours on a circular chart. The operation recorder also covers the 24-hour period and indicates on the chart the cycles of on and off of the electrical motor.

Full information on these instruments may be obtained by addressing the company for copies of literature.

◆

118—Space Heater

Entirely new cabinet design for eye-appeal is a feature of two circulating heaters announced by the Heater Division of Motor Wheel Corp.

The M. W. Utility Circulator Model

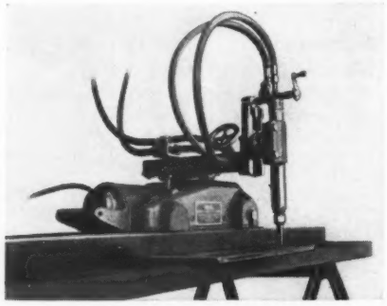
(shown in cut) is offered in a pebbled finish with modern lines. The DeLuxe model is finished in full porcelain enamel with stainless steel trim.

The top grills of these units are constructed so that the warmed air is diffused and sent out of the top at a 45-degree angle.

119—Oxweld Cutting Machine

The Linde Air Products Company, 30 East 42nd Street, New York, N. Y., has just announced CM-8 Cutting Machine.

The machine does automatic straight line cutting of practically unlimited length, straight bevel cutting, two



bevels at a time if desired, plate edge preparation, circle or ring cutting of diameters up to 100 inches and the cutting of curved or irregular shapes.

One blowpipe, the Oxweld C-7, is supplied as standard equipment, permitting cuts up to 12 inches. The Oxweld C-22 Blowpipe may be substituted for heavier cutting. Provision is made for the use of two blowpipes simultaneously. These can be mounted either on the same or opposite sides of the machine, and adjusted independently. The slide for the blowpipe holders is constructed so that it may be swung instantly into any horizontal position over a working arc of 250 degrees.

120—Thermostats

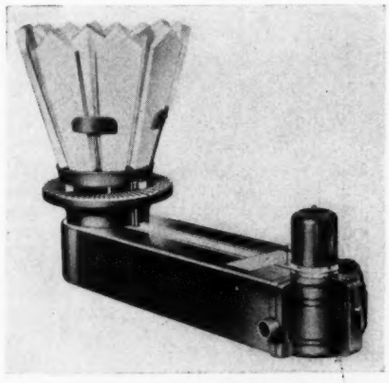
Two new thermostats, one of the single acting type and the second a dual thermostat for day-night operation, are announced by Gleason-Avery, Inc., 27 Clark Street, Auburn, N. Y. The company is also manufacturing an electric automatic time switch and an electrically operated damper motor.

The two thermostats are contained in round casings, with the thermometer prominently mounted at the face and radio type dials showing temperature settings. Both units are of the three-wire, low voltage type. The thermometer is said to be accurate within 1 degree F. A special heat treated thermostatic metal coil eight inches long, with iridio-platinum contacts on blade and contact screws, gives an operating differential of ¾ of 1 degree F., with the thermostat sensitive to a change of less than ½ degree.

The damper motor has a General Electric, reversible, shaded pole motor, operating at 110 volts A. C. No transformer is required. The unit is designed to be connected to a 25-volt thermostat circuit. The arms make quarter revolutions providing a maximum travel of 5 inches. The motor will raise 15 pounds of weight at the end of the arm.

121—Conversion Burner

A new conversion burner, designed for attractive appearance and to eliminate the usual complicated appearance, is announced by Surface Combustion Corporation, Toledo, Ohio.



The unit consists primarily of an aluminum piston alloy material to give strength with minimum weight. Concealment of control assembly protects these parts from dirt and eliminates careless pampering. The unit is furnished in a pleasing two-color lacquer finish. Finger-tip control, through a single cock on the front end of the unit, is provided. A small two-way toggle switch cuts out the lighter circuit as a safety protection.

News Items . . . . . .

National Warm Air Meeting

Pittsburgh, Pa., was selected as the place for the December Convention of the National Warm Air Heating and Air Conditioning Association because of the tremendous interest existing in that area in warm air heating and other phases of air conditioning, and because the Association has never met in that city.

The program which follows will indicate how pertinent, timely, and helpful every subject is and how ably each will be presented.

Thursday afternoon meetings will be held in the United States Bureau of Mines which will add just that much more to the interest in the Association's Convention. The other sessions will be held in the Hotel William Penn.

Fare and one-third round trip with tickets good for thirty days has been granted under the Certificate plan. Certificates may be secured from the Association's Managing Director, Allen W. Williams, 50 West Broad Street, Columbus, Ohio.

Some brief mention of the program follows:

December 5th

The Federal Housing Program—Ex-Governor A. O. Eberhart, Federal Housing Administration, Washington.

Layouts for Air Conditioning Including Mechanical Heating, J. Earle Maynard.

Our Technical Educational Committee, J. H. Van Alsburg.

The Industry's Installation Codes, Professor J. D. Hoffman.

The NRA Codes of our Industry:

Roofing and Sheet Metal Contracting Industry, W. C. Markle.

Furnace Manufacturing Industry, A. W. Wrieden.

Register Manufacturing Industry, R. W. Blanchard.

Furnace Pipe and Fittings Industry, E. S. Moncrief.

Address, Charles E. Kettering.

The Comfort Chart and Cold Wall Effect, F. C. Houghten.

December 6th

Research Advisory Committee Report, F. G. Sedgwick, Chairman.

The New Research Reference Volume, Edwin A. Scott, Professor J. D. Hoffman.

Design and Performance Problems in Forced Air Heating and Air Conditioning, A. P. Kratz, Research Professor.

Studies in Summer Cooling in the Research Residence During the Summer of 1934, S. Konzo, Special Research Associate.

Immediately after lunch all present will proceed to the Bureau of Mines Auditorium.

Inspection of the American Society of Heating and Ventilating Engineer's Laboratory in the Bureau of Mines —including the rooms used for comfort chart and the effect of cold walls research.

◆

St. Louis Home Exposition

The St. Louis Modern Home Exposition, originally scheduled for November 10th to 18th, has been changed to January 5th to 13th, at the request of the Federal Housing Administration.

The reason for the change in date is that the Better Housing Program is just getting under way in St. Louis and it is felt that the January date will see the campaign sufficiently far along to stimulate increased interest in better homes.

The St. Louis Modern Home Exposition will have some 400 exhibits and will be held in the Exhibition Hall of the new St. Louis Municipal Auditorium.

◆

W. Roy Eichberg Recovering

W. Roy Eichberg, of the Carolina Sheet Metal Corporation, Philadelphia, member of the National Code Authority Committee and representative on the National Committee of Zone 3, is reported recovering from a serious illness. Mr. Eichberg was removed from the hospital some time ago and is now seeing visitors at his home.

News Items . . . . . .

Housing Act Notes

In several parts of the country a scheme is being tried out wherein one complete estimate is submitted to the home owner applying for a F. H. A. loan. A general contractor, qualified to give an accurate estimate and prepared to deliver a complete modernization job, is the key to this new modernization movement. Under the general contractor the sheet metal worker, heating contractor, carpenter, mason and plumber make their estimates and submit bids to the central co-operative office. These bids are compiled in one general estimate of cost which is submitted to the home owner through the general contractor.

The chief advantage claimed for this system is that the home owner knows in advance just what a complete remodeling job is going to cost and, in addition, the scheme is claimed to save considerable time now involved in separate negotiations between contractors and the home owner. When a contract is obtained and the work completed each individual contractor collects his share from the total paid to the co-operative office.

The scheme is said to have one other advantage; namely, where the home owner is compelled to listen to suggestions by several individual contractors he becomes discouraged, whereas under the co-operative plan each contractor makes his own survey and the home owner can determine just what work he wishes to have done from the complete modernizing program recommended by the general contractor.

Some other communities in the country are organizing what is known as a community statistical survey. This program had its inception in Seattle, Washington. A group of skilled workmen made a thorough inspection of each section of Seattle allotted to them and reported on the conditions and needs of each individual residential or business property in their area. When the investigation was completed information on practically every structure in the city had been compiled.

◆

The Iron Man

If it's a parade or country fair you'll see Reyman's "Iron Man" in the crowd. When the Iron Man is not parading he is stationed in front of Reyman's Sheet Metal Works in Alamosa, Colorado.

The Iron Man is known to many communities besides the home town, as it is constructed so that it may be

easily transported about on the rear of an automobile or truck.

Standing seven feet high, weighing slightly over twenty-five pounds and built at a cost of $30.00 this metal man, symbolic of a sheet metal business, has proven the best advertisement Mr. Reyman has discovered.

Mr. Reyman has had engravings and a rubber stamp made which he uses in printing and advertising.

News Items . . . . . .

Health With Even Temperatures

"It is better for a thermometer to read 68 degrees than 70 degrees," says the Metropolitan Life Insurance Company in a health booklet entitled "Just a Cold." "Overheated room cause more colds than underheated," the booklet continues.

In the studies of the New York Commission on Ventilation, it was found that an increase of two degrees above normal room temperature brought a 70 per cent increase in ailments of the nose and throat. With a temperature of 75 degrees people did 15 per cent less work than a room 68 degrees. Statistics show that about three million people are ill in bed each day, and that at least 50 per cent of these people are ill because they caught a cold.

Aside from the question of health, there is the item of expense. The economy of uniform heat is often overlooked. The waste of overheating is demonstrated by a table recently published by an authority on the subject. It is not necessary to heat beyond 70 or 72 degrees in order to be comfortable and enjoy a healthy atmosphere.

The table quoted below shows how costly it is to heat beyond 70 degrees.

Temperatures	Extra cost over 70 degrees
71	3.1 per cent more
72	6.2 per cent more
73	9.4 per cent more
74	12.5 per cent more
75	15.6 per cent more
76	18.7 per cent more
77	21.9 per cent more
78	25.0 per cent more
79	28.0 per cent more
80	31.0 per cent more

◆

Harry Jones Joins Lamneck Products

Lamneck Products, Incorporated, Columbus, Ohio, recently reorganized, announced the appointment of Harry R. Jones as manager of the Furnace Pipe, Fittings and Register Department. Mr. Jones was formerly connected with Standard Supply Company in Indianapolis and later with the Jones-Jordan Company.

Lamneck Products are successors to the W. E. Lamneck Company, manufacturers of furnace pipe, fittings and registers for many years. The company is actively engaged in manufacturing and distributing the items originally manufactured by the old Lamneck Company.

◆

Welding Convention

The 35th Annual Convention of the International Acetylene Association will be held in the William Penn Hotel, Pittsburgh, Pennsylvania, November 14, 15 and 16.

The program announces sessions devoted to oxy-acetylene cutting in steel mill work, a four-act industrial drama, metallurgical aspects of welding, pipe welding and testing and welding in transportation.

◆

Ward to Handle Rotex

Ward Machinery Company of Chicago, has taken on the distribution of the Rotex line of punches made by M. Bollaert, Oakland, California.

Ward Machinery Company has special literature available on this line of punches which they will be very glad to send to anyone interested.

◆

Jack Weiner Opens Jobbing Business

Jack Weiner, President of the Furnace and Sheet Metal Institute of Chicago, has moved his sheet metal and furnace shop from his location on Lincoln Avenue to 741 West Lake Street. He has also taken space at 739, adjoining, and opened the only jobbing supply store in the downtown district.

The name of the contracting firm remains Columbia Sheet Metal Company and Jack has adopted the name Columbia Sheet Metal Supply Company for his new business. At present the supply business is being operated as a cash and carry business handling all sheet metal and heating materials.

Statement of Ownership and Management of "American Artisan" for October 1, 1934

The following is a statement of ownership, management, etc., as required by the Act of Congress of March 3, 1933, of "American Artisan," published monthly at Chicago, Illinois, for October 1, 1934:

STATE OF ILLINOIS, COUNTY OF COOK.

Before me, a Notary Public in and for the State and County aforesaid, personally appeared F. P. Keeney, who, having been duly sworn according to law, deposes and says that he is the business manager of the AMERICAN ARTISAN, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher, Keeney Publishing Company, Chicago, Illinois.
Editor, J. D. Wilder, Chicago, Illinois.
Managing Editor, J. D. Wilder, Chicago, Illinois.
Business Manager, F. P. Keeney, Chicago, Illinois.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Keeney Publishing Company, 6 North Michigan Avenue, Chicago, Illinois. Stockholders: F. P. Keeney, Chicago; W. J. Osborn, Fairfield, Conn.; R. P. Wettstein, Chicago; C. E. Price, Chicago; R. A. Jack, Cleveland Heights, Ohio.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

F. P. KEENEY.

Sworn to and subscribed before me this 1st day of October, 1934.
GRACE E. WAYMIRE
(My commission expires February 10, 1938.)

New Literature . . . . . .

For your convenience a number has been assigned each item in this column. A coupon will be found on page 61. Check the items you want and mail to us. We will forward the information you check.

221—University of Illinois Bulletin No. 266

The University of Illinois Experiment Station, conducting the research work in the Research Residence at Urbana, announce the publication of bulletin No. 266 covering the investigation of warm air furnaces and heating systems employing mechanical distribution. The bulletin may be secured by writing the University of Illinois, Urbana, Illinois. The price is $1.00.

◆

222—New Chemistry Handbook

"Practical Everyday Chemistry," is a book of formulae, simply written, that tells how to make adhesives, alloys, animal remedies, anti-freezes, antiseptics, automobile specialties, blacking, bleaches, bakery preparations, carbon paper, cements, colors, cosmetics, crayons, disinfectants, drugs, dyeing, emulsions, extracts, fireproofing, fireworks, garden specialties, greases, inks, insecticides, liquors, mouth washes, paints, plating, polishes, soaps and cleaners, stain removers, varnishes, and hundreds of other articles in daily usage in office, factory, school and home.

This book is "practical" and modern in context, making use of many new chemicals and processes discovered right up to 1934. It is an education in the composition of familiar materials because of the great variety of subjects covered. Price $2.00.

◆

223—Duotherm Leaflet

Clarage Fan Company, Kalamazoo, Michigan, announce a new leaflet describing the Clarage Duotherm, a complete air conditioning unit for residential installation.

The unit consists of filters and twin blowers, heating and cooling coils ready for connection to some source of heat or cold supply, humidifying apparatus and complete controls. The unit comes as a housed item ready for connection to the boiler and distributing system.

The leaflet describes the design, construction and operation of the unit accompanied by information of interest to the home owner. A typical installation is described in detail explaining in customer language how the unit air conditions in winter and in summer.

◆

224—Punch Leaflet

A leaflet describing Rotex 10 Quick Change Punch, a portable shop machine having nine punches and a shear, is announced by Ward Machinery Co., 564 West Washington Boulevard, Chicago, Illinois. This new punch has the individual punches mounted for instant use. The smaller punches will punch 12-gage, while the 2-inch punch will work in 20-gage. The shear will cut 14-gage metal and will cut odd shaped holes.

◆

225—Penn Control Catalogs

Penn Electric Switch Co., Des Moines, Iowa, announce two revised catalogs; the first a complete catalog of all the control apparatus manufactured by the company. Each item is shown by illustration and accompanying text gives full information on the design, construction and possible uses of the instruments. The catalog also contains information on the Penn Temtrol system and the apparatus used with this system.

The second catalog covers Penn apparatus for domestic and commercial refrigeration. Thermostats for refrigeration service, water regulators for all refrigerants, and magnet switches comprise the company's line and are shown with full explanations.

Both catalogs are made up in loose-leaf form and are accompanied by 1934 revised price schedules.

New Literature . . . .

For your convenience a number has been assigned each item in this column. A coupon will be found on page 61. Check the items you want and mail to us. We will forward the information you check.

226—Ventilator Leaflets

Accurate Mfg. Works, 2432 Milwaukee Ave., Chicago, Illinois, have prepared four new leaflets describing the Accurate chimney top and the Accurate revolving ventilator. Each leaflet takes up a particular use of the item and presents full information on the equipment.

One leaflet describes the chimney top with cast base and explains how the ventilator should be installed for various types of chimneys. A table of sizes, weights and prices is published.

A second leaflet describes the ventilator recommended for use in poultry houses. Text covers the proper method of application while tables contain all necessary information on sizes, weights, prices, etc.

A third leaflet describes revolving ventilators for dairies, hen houses, tarm barns, foundries and industrial plants of several kinds. Illustrations show typical applications.

◆

227—Register and Grille Catalog

Independent Register & Mfg. Co., 3747 East 93rd Street, Cleveland, Ohio, announce catalog No. 35FA, a complete presentation of the company's line of registers and grilles for forced air work.

The various products are presented in elaborate style with photographs, and full information on such important facts as proper selection, application and use of the various items. The new "Fabrikated" adjustable directed air flow registers recently introduced are shown in complete detail with all necessary information on size of opening, dimensions of bars, blades and frames. In addition to these newer drawings, the company's standard line of side-wall registers, one-piece and two-piece; baseboard registers, one-piece and two-piece; multiple valves; tandem valves; registers and various types of return air registers and grilles are presented with full information on sizes, prices, finishes, etc.

◆

228—Welding Leaflets

Two revised welding leaflets are announced by The Lincoln Electric Company, Cleveland, Ohio.

One leaflet covers the engine-driven type of generator-welder with information on design, construction, capacities and operation. Drawings and photographs show the principal details of the equipment.

The second leaflet covers the direct-current motor driven welding generators of the portable type suitable for shop or field operation. Full information is presented in the leaflet.

◆

229—Rotogravure Tabloid

Republic Steel Corporation, Massillon, Ohio, have prepared a subject tabloid containing twelve pages of exhibit illustrations at the 1934 Century of Progress Exposition in which their products were used or displayed. The illustrations include such important exhibits as the Chrysler and General Motors Buildings; several model houses; high-speed trains, airplanes and motor cars; model kitchens; industrial display booths and buildings; model villages and many other uses. Elaborate photographs are used to show the application of the material and captions for the illustrations explain in complete detail the various applications used.

◆

230—Chain Catalog

The 1934 catalog of the Smith and Egge Division of the Turner & Seymour Mfg. Co., Torrington, Connecticut, presents complete information on the various types of sash chain, sash chain fixtures, transom chain and fixtures, cable chain, sprocket chain, furnace chain, etc., manufactured by the company. Illustrations show the various items and tables give sizes, lengths, prices and finishes.

Columbus Ass'n Investigates Overhead

(*Continued from page 22*)

Code Regulations will undoubtedly insist upon a uniform method regardless of the size of the individual concern. If it was not for this fact we would recommend a different system for the larger Institutions having extensive shop operations and plant investment. This recommendation would include the segregating of overhead expenses under the three titles previously mentioned, namely: general, selling and factory.

The factory expenses would be allocated by percentage of these expenses to the direct labor involved.

Features of Methods

Selling and general administrative expenses to be charged in percentage of the total volume of business.

Substantial arguments can be advanced in favor of any one of the classifications, but practically all have their individual shortcomings. We can readily appreciate that the productive hour method or the percentage in relationship to direct labor throws a decidedly heavy burden on a job in which labor might represent 80 per cent of the total and material only 20 per cent. On the other hand, if based on percentage in relationship to material a particular contract might have matured representing 80 per cent of the total. This also would throw a very heavy burden on this particular contract.

Columbus' Recommendation

After studying our industry and taking into consideration the different classes of work and the wide discrepancy in the volume of work done by the various institutions, a system of basing the percentage on the two prime factors of material and labor has the strongest appeal.

In fabricating, erecting or applying we have our money invested whether it be in labor or material and most all general and selling expenses are present regardless of whether material or labor is the larger amount. It is only when we get into the larger plant investment that the arguments for distribution by percentage in relationship to direct labor or productive hours are readily justified.

Interesting Figures

If we refer back to Date Sheet Number 5 we can get some idea as to this variation between direct labor in relationship to material, especially where we have a report on both years. As the percentage

(*Continued on page 62*)

New Literature . . . .

For your convenience a number has been assigned each item in this column. A coupon will be found on page 61. Check the items you want and mail to us. We will forward the information you check.

231—Conversion Gas Burner Leaflets

Barber Gas Burner Company, 3702 Superior Avenue, Cleveland, Ohio, announce revised sheets of general catalog No. 34, covering:

Series "A", automatic burners with magnetic gas valve control for round steam, vapor or hot water boilers or warm air furnaces.

Series "B", automatic burners with motor gas valve control.

Series "M", burners with manual control.

Series "S", automatic burners for installation in houses already equipped with automatic heat control.

Series X-10 burner unit with blower baffled.

The pages show the units and methods of installation and contain tabulations of sizes, diameters, grate surfaces, capacities, weights and prices.

The company has also prepared a four-page general catalog showing the Barber conversion unit with full information on design, method of application and necessary accessories.

◆

232—Fan Catalog

Meier Electric & Machine Co., 3525 East Washington Street, Indianapolis, Ind., announce a ventilating and exhaust fan catalog in loose-leaf form showing the various types of propeller type fans manufactured by the company. The catalog is arranged for types of application and individual sections cover all-purpose ventilating fans, aluminum propeller fans, portable coolers (fans), extended shaft, belt and gear drive fans, ceiling type fans and such special units as furnace fans, confined space exhausters, refrigerating fans, etc.

Each section contains complete tabulations of sizes, blade design and free air delivery ratings, speeds, horsepower sizes, current consumption and weights.

AMERICAN ARTISAN
6 North Michigan Ave.,
Chicago, Ill.

Send me more information about the products mentioned in your New Products section. Also see that I get a copy of the following literature mentioned in your New Literature section. I have checked the reference numbers of the items I am interested in.

New Products	New Literature
110	221 .....
111	222 .....
112	223 .....
113	224 .....
114	225 .....
115	226 .....
116	227 .....
117	228 .....
118	229 .....
119	230 .....
120	231 .....
121	232 .....

Clip this coupon to your letterhead for prompt reply.

Columbus Ass'n Investigates Overhead

(*Continued from page 60*)

for that particular year is constant relative to the expenses of that year, we can subtract the percentage given for material from the percentage given for direct labor which gives us a resultant factor. Applying the same process to the following year the resultant factor should be the same if direct labor and material were always practically in the same proportion.

Most of this report has been devoted to bring home to you an appreciation of this most important Overhead Factor and suggesting a fair and equitable means of distribution.

The items which should be included in the make-up of this factor are just as important, especially some of the controversial items which require plain, common business sense to determine.

We know of a number of concerns, either operated individually or with a partnership in which no salaries are included for the owners of this business, but they are content to take out small amounts for actual living expenses with the result that their so-called business never returns to them an adequate salary for the ability or energy that they put in their work, or pays a fair return on their investment or compensate them for the risk that they assume.

Overhead's Importance

We maintain that the proper knowledge of—a proper accounting of—and the proper application of—Overhead in many cases is the difference between profit and loss.

If code regulation accomplishes no more than establishing and insisting upon proper accounting methods and uniform system of application it will have accomplished a wonderful purpose.

Some of the members of the industry perhaps will argue that this is striking at their individualism. We cannot agree with this point of view. It is a plain case of having everything to gain and nothing to lose and in many cases would probably prevent an unpleasant visit from the sheriff.

Mr. Armstrong is chairman of the Columbus Association Committee which conducted this survey. If you have any questions or wish to discuss some of the points raised, write Mr. Armstrong in care of American Artisan.

The Editors.

F. H. A.- Its Aims and Program

(*Continued from page* 18)

rectly to an approved bank, trust company, personal finance company, mortgage company, building and loan association, installment lending company or other qualified financial institution, fill out and sign a promissory note. He then receives the proceeds and either engages contractors or purchases materials and does the work himself and pays the bills on the lowest cash basis.

Or the property owner may present his credit statement to the financial institution and if approved sign a note and receive the proceeds in cash.

Or the property owner may submit his credit statement to a contractor or dealer. The latter submits the statement to a financial institution for credit approval. If approved, contractor proceeds with the work. Upon completion of the job the property owner gives the contractor or dealer, his promissory note for payment. The contractor or dealer may endorse the note without recourse, sell it to a financial institution and obtain cash in payment of the job.

Unless contrary to existing codes, there is no objection to the contractor or to the sales company who furnish the material taking the property owner's note without interest or discount charges and absorbing the cost of turning it into cash. The contractor or dealer would be merely allowing a discount of five percent for all cash to the property owner, and in this case the financing would cost the owner nothing.

Full authority and responsibility rest with the financial institution for approving the credit of the property owner. Each note which meets with the simple requirements heretofore set forth, is insured automatically when acquired by an approved financial institution. So far as insurance protection is concerned the statements of the borrower will be accepted as final as to correctness, in the event a claim for loss becomes necessary. It is of course vital that the property owner should not assume an obligation that is too large, or which extends over too long a period.

This year, over the country at large, there will probably be spent, one hundred million dollars for Emergency Relief. Yet a large share of this relief is necessitated by the unemployment in the durable goods industries and particularly in the building and inter-related fields. Since 1928 building has fallen off so fast that not only has a large part of industry become dislocated because of it, but a huge share of our male population who never did any other kind of work in their lives suddenly had their entire world of livelihood completely pulled out from under them.

What man would rather see the Government spend this sum to put these people to work rather than to spend it because of their non-employment. These people must live. They must be fed. And they have been, under two separate National Administrations. No form of Government can shirk its responsibility in this regard. Looked at from that standpoint alone this Modernizing Section of the National Housing Act should not cost the taxpayers of the country one red cent.

Code Authority Organization

(Continued from page 17)

SECRETARY-TREASURER: F. A. Mero, Mastercraft Tile & Flooring Co., Box 1086, Richmond.

MEMBERS AT LARGE:

DISTRICTS

SAN FRANCISCO: Fred J. Dunn, F. J. Dunn Roofing Co., 3597 Mission St., San Francisco.

CENTRAL CALIFORNIA: Walter A. Edwards; California Roofing Co., 72 N. Fourth St., San Jose.

REDWOOD EMPIRE: D. C. Little, 447 Magnolia St., Larkspur.

LOS ANGELES: Frank B. Humberstone, Security Roof Co., 7578 Melrose Ave., Los Angeles.

EAST BAY: Stiles Wells, Bay Cities Asbestos Co., Ltd., 188 Tenth St., Oakland.

TRI-COUNTIES: E. H. Hewston; H. & H. Roofing Co., 108 N. Salsipuedes St., Santa Barbara.

SAN JOAQUIN: T. A. Osborne, Faris-Osborne Co., 720 Fulton St., Fresno.

SAN GABRIEL VALLEY: John Lytle, J. W. Lytle Co., 136 Huntington Dr., Pasadena.

ORANGE COUNTY, George L. Vance, Vance Roofing Co., 114 S. Harvard Ave., Fullerton.

HARBOR: John Thompson; Thompson Roofing Co., Long Beach.

Utah

ROOFING CONTRACTORS

CHAIRMAN: B. T. Cannon: Utah Roof Cement Co., 18 E. South Temple, Salt Lake.

VICE-CHAIRMAN: Curtis Zarr, Dooley Bldg., Salt Lake.

SECRETARY-TREASURER: F. H. Ebert, 1293 Hudson Ave., Salt Lake.

SALT LAKE CITY, SHEET METAL

CHAIRMAN: Henry G. Blumenthal; 474 Center St., Provo City.

VICE-CHAIRMAN: David B. Stuart; 155 24th St., Ogden City.

EXECUTIVE SECRETARY-TREASURER: W. A. Middleton; 750 South State St., Salt Lake City.

Washington

SPOKANE, ROOFING & SHEET METAL

CHAIRMAN: Arth Hobbs; Marshall-Wells Sht. Mtl. Shop, S. 157 Howard St., Spokane.

VICE-CHAIRMAN: C. P. Dougherty; Areweld Furnace Distributors, W. 822 2nd Ave., Spokane.

SECRETARY-TREASURER: D. W. Disotell; W. 824 2nd Ave., Spokane.

MEMBERS AT LARGE: Harry M. Snyder, Spokane Roofing Co., W. 411 Sprague Ave.; E. L. Bell, Reliable Roofing Co., S. 308 Wash. St., Spokane; G. G. Krause, Brown Brothers, W. 316 Sprague Ave., Spokane.

WASHINGTON, EASTERN DISTRICT

SPOKANE DIVISION: Frank E. Baumgartner, Brandt Bros., W. 14th Main Ave., Spokane; John Hulberg, Spokane Tin & Sht. Iron Wks., E. 1326 Sprague Ave., Spokane; Irving Atwater, Nott-Atwater Co., S. 157 Monroe St., Spokane.

WALLA WALLA DIVISION: Joseph E. Maher, Western Sht. Mtl. Wks., Walla Walla.

YAKIMA-WENATCHEE DIVISION: G. E. Salisbury, Valley Roofing & Supply Company, Yakima.

SEATTLE, LOCAL CODE AUTHORITY

MEMBERS AT LARGE: William Carsten, Majestic Fur. Co., 1723 Westlake Ave., N., Seattle; G. E. Peterman, Peterman Roofing Co., 1132 W. 63rd St., Seattle; Carl Honore, Honore Sht. Met. Co., 926 Elliott Ave., W., Seattle; Mark Favro, Builders Sht. Met. Co., 1716 Yale Ave., Seattle; Marcus E. Getchell, Getchell Roofing & Flooring Co., 800 Aloha Street, Seattle.

EXECUTIVE SECRETARY: Robert W. Larsen; P. O. Box 3047, Seattle.

TACOMA DIVISION, WESTERN DISTRICT

MEMBERS AT LARGE: William Burke, George Gohri, Ed. Miller, P. M. Holaday, Mr. Rose, D. Maltby.

SECRETARY: Richard Feix, 406 Puyallup Ave., Tacoma.

EVERETT DIVISION, WESTERN DISTRICT

MEMBERS AT LARGE: H. R. Johnson, I. Beagle, E. Zimmerman.

BELLINGHAM DIVISION, WESTERN DISTRICT

CHAIRMAN: A. Franzke, Bellingham Sht. Mtl. Wks., 119 W. Chestnut St., Bellingham.

SECRETARY: A. H. Ershig, J. M. Laube & Son, Inc., 1210 State Street, Bellingham.

MEMBERS AT LARGE: A. Bethke, Flat Roofing, 2212 B. Street, Bellingham; E. J. Frith, Lynden Wks., Bellingham; E. A. Alm, Alm Sht. Mtl. Wks., Bellingham.

GRAYS HARBOR DIVISION, WESTERN DISTRICT

CHAIRMAN: H. J. Pryde, Pryde Bros., 405 E. Wishkah St., Aberdeen.

VICE-CHAIRMAN: L. J. Russell, 408 E. Wishkah Street, Aberdeen.

SECRETARY: Walter J. Losli, Smith & Losli, 406 E. Market St., Aberdeen.

WESTERN DISTRICT, WASHINGTON

Divisions

SEATTLE DIVISION: Edward Flohr, 3631 E. Marginal Way, Seattle; Angus Buchanan, 901 Fairview, N., Seattle; Walter Zainey, 7406 Greenwood Ave., Seattle.

TACOMA DIVISION: Dayton Maltby, 1129 St. Paul St., Tacoma; George Gehri, 1117 S. Tacoma Ave., Tacoma.

BELLINGHAM DIVISION: F. E. Laube, 1210 State St., Bellingham.

EVERETT DIVISION: E. B. Bergeson, 2808 Rucker St., Everett.

GRAYS HARBOR DIVISION: W. J. Losli, 406 E. Market St., Aberdeen.

SOUTHWESTERN WASHINGTON DIVISION. M. W. Tobin, 209 State St., Olympia.

Oregon

OREGON STATE, ROOFING & SHEET METAL CONTRACTORS

MEMBERS AT LARGE: J. M. Nisbet, J. C. Bayer, 14 S. W. Market St., Portland; E. E. Carroll, Kleenair Furnace Co., 5329 N. E. Sandy, Portland; H. L. Kelley, Kelley Bros., 936 S. E. 34th Ave., Portland; W. R. Bailey, Superior Roofing & Paint Co., 4029 N. E. Sandy, Portland; Roy Wetle, McDonald & Wetle, 915 S. E. Hawthorne, Portland; Earl Moore, General Roofing Co., 3580 S. E. Hawthorne, Portland; Arthur Glesie, American Sht. Mtl. Wks., N. E. 11th Street & Glisan, Portland; William Mau, Oregon Sht. Metl. Wks., 618 S. E. 1st St., Portland.

SECRETARY: A. W. Stanchfield; 201 Worcester Bldg., Portland.

◆

In addition to these committees, names and addresses of code authority committees for the states of Texas, Louisiana, Arkansas and New Mexico, and subdivisions thereof, have been received as follows:

Texas

STATE ADMINISTRATION BOARD

Robert Jones, Dallas; E. O. Wood, Ft. Worth; Jas. Hooks, Abilene; C. W. Schafer, Houston; Paul Woodward, Wichita Falls; J. Applewhite, Beeville; C. F. Bonn, San Antonio;

O. H. Buass, Austin; C. H. Ruebeck, Waco; Jas. Walsh, Brownsville; H. Welsch, El Paso; R. E. Coale, Houston; Roy Holliday, Houston.

LOCAL CODE ADMINISTRATORS

SAN ANGELO: H. G. Wendland.

FT. WORTH: J. W. Morris, Chairman, Chas. A. Keetch, W. E. Monday, Secy., Martin Marsalis, Warren Pugh.

SAN ANTONIO: A. B. Compton, Chairman, J. A. Williams, Harry Dean, Secy., R. M. Parker, T. L. Seagraves.

HOUSTON: F. H. McSweeney, Sheet Metal; W. R. Etie, Sheet Metal; Joe Blumenthal, Sheet Metal; H. D. Radley, Sheet Metal; Harvey Hutcheson, Sheet Metal; P. E. Tommie, Roofing; W. A. Shaw, Roofing; W. H. Clark, Roofing; Frank Moore, Roofing; P. A. Munro, Roofing.

DALLAS: E. J. Railton, Sheet Metal; T. E. Bayne, Sheet Metal; Fred S. Wilcox, Sheet Metal; G. G. Slack, Sheet Metal; A. C. Horn, Sheet Metal; T. A. Helm, Roofing; Paul Griffith, Roofing; C. O. Johnson, Roofing; A. C. January, Roofing; J. C. Clardy, Roofing.

LUFKIN: Sam H. Kerr.

LAREDO: A. R. Benavides.

CORPUS CHRISTI: John Marlatt.

AMARILLO: Price Hooks.

CROWELL: M. S. Henry.

WICHITA FALLS: A. C. Epps, M. B. Dickerman.

LUBBOCK: C. H. Hamilton.

BIG SPRINGS: Guy Tamsitt.

Louisiana

STATE ADMINISTRATION BOARD

E. W. Blattman, Chairman, New Orleans; O. G. Wilson, Alexandria; H. H. Bain, Shreveport; Roger Belletier, New Orleans; T. C. Quirck, Opelousas; C. E. Manigan, Lake Charles; J. G. Bell, Monroe.

LOCAL CODE ADMINISTRATORS

SHREVEPORT: S. L. Gorton, A. C. Richard, J. R. Johnson.

ALEXANDRIA: W. J. Grimollion.

NEW ORLEANS: Louis P. Durant, Sheet Metal; C. Guest, Sheet Metal; R. J. Holzer, Sheet Metal; G. W. Richardson, Sheet Metal; F. C. Vogt, Sheet Metal; Fred C. Taylor, Roofing; Albert Brandin, Roofing; Thos. W. Griffith, Roofing; Horace White, Roofing; Clifford Favrot, Roofing.

Arkansas

STATE CODE ADMINISTRATION BOARD

Carl Stahl, Little Rock; R. M. Falk, Little Rock; C. A. Covington, Conway; Robt. Burns, Camden; E. A. Conrad, Stutgart; Ben DeBons, Paragould; W. Pope, Helena.

LOCAL CODE ADMINISTRATORS

LITTLE ROCK: Carrol Brown, Ben Booth, W. E. Ducker, Jas. Collins, John Kitchen.

HOT SPRINGS: A. L. Manning, Ed. Smith.

FT. SMITH: Chas. Carr, Chas. Hummel.

BATESVILLE: Sidney Luster.

MONTICELLO: L. D. McQuiston.

PINE BLUFF: John H. Steck.

TEXARKANA: Albert Little.

JONESBORO: J. C. Stewart.

New Mexico

STATE CODE ADMINISTRATION BOARD

Frank Phillips, Albuquerque; H. R. McDowell, Albuquerque; Valley Sheet Metal Wks., Las Crucos; R. R. Radcliff, Gallup; J. W. Culpepper, Carlsbad; Wm. Kellog, Santa Fe.

LOCAL CODE ADMINISTRATORS

ALBUQUERQUE: L. J. Walsh, Geo. Stripe, Mack Jones.

ROSWELL: Paul Carrigan.

TAOS: J. M. Victory.

RATON: Murphy Sheet Metal Works.

CARLSBAD: R. M. Burnet.

SANTA FE: Frank Laurant.

CLASSIFIED ADVERTISING

4 cents for each word including heading and address. Count seven words for keyed address. Minimum $1.00 for each insertion. One inch $3.00. Cash must accompany order. Copy should reach us eight days in advance of publication date. Display rates for this page will be furnished on request.

SITUATIONS OPEN

OPPORTUNITY—We need first class salesmen and manufacturers agents to represent us on the sale of Only Original Soot Destroyer and Boiler Water Treatment in all open territory. Attractive proposition to the right men. Saginaw Salt Products Company, Saginaw, Michigan.

WANTED—Sheet Metal Worker with experience in soliciting and estimating for shop doing cornice, skylight, ventilating, blow pipe and general sheet metal work. Must be able to make drawings and details. Address Key 294, "American Artisan," 6 North Michigan Ave., Chicago, Ill.

Manufacturers Agents

MANUFACTURERS WANTING ADditional representation often come to us for names of prospective agents now handling other lines in this field on a commission basis in a definite territory. It will pay you to be on record with us so we can refer your name to interested manufacturers. No charge or obligation, of course. It is a service we render free to manufacturer and representative. Just drop a line that you are interested in being on file and we will send you form to fill out. Address American Artisan, 6 N. Michigan Ave., Chicago, Ill.

FOR SALE

Don't guess at making your ventilators. Send for my drawing, showing correct proportions for all size ventilators. Simple rule to use. With this is included "Grove's Skylight Bar Computer," illustrated, showing easy method of finding all lengths of bars from 3" to 12" pitch. Drawing 12"x14". 25c silver. W. S. Grove, 26 South 28th Street, Penbrook-Harrisburg, Pennsylvania.

FOR SALE

FOR SALE—Established Hardware, Plumbing and Sheet Metal business. H. C. Kamholz, West McHenry, Illinois.

FOR SALE

FOR SALE—One Chicago Brake, 8 ft. to 18 gauge iron. W. H. Campbell, Alpena, Michigan.

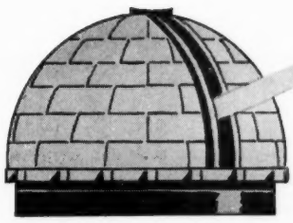
BUSINESS FOR SALE—Established manufacturing and distributing. Necessities to warm air heating. Exceptional opportunity. A going business and profitable for a hustler. Replies positively confidential. Owners wishing to retire. Address Key 295, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

Index to Advertisers

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in alternate issues is marked with an asterisk.

November, 1934

Revere Sees Stars

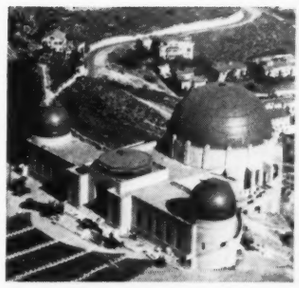


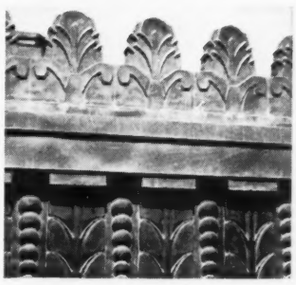
● 30,000 pounds of 16 oz. cold rolled Revere Copper were used on the new Griffith Observatory at Los Angeles.* This beautiful building contains the most modern astronomical instruments available to science . . . includes a planetarium and two complete observatories.

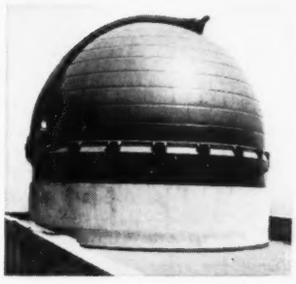
The large dome, or planetarium, is 84 ft. in diameter and 42 ft. high . . . and required 15,000 lbs. of Revere Copper. The observatory domes are fully copper clad, including copper-covered shutters. The octagon foyer dome has a standing seam copper roof and embossed copper sides. The copper on the three domes is interlocked and mechanically attached without the use of any solder.

Millions of dollars of equipment are protected by this sheet copper roofing. Revere was used, because Revere has a reputation. It is known to be rust-proof and weather-proof . . . trouble-proof for years to come.

Let Revere's reputation help you, too. During the coming months, America is planning new roofing for homes, stores, and public buildings. This means many new jobs for you. Make sure of your success by using materials of known worth. Use Revere.







(Top) Air photo of observatory; (Center) Embossed copper walls; (Bottom) Interlocked roof construction.

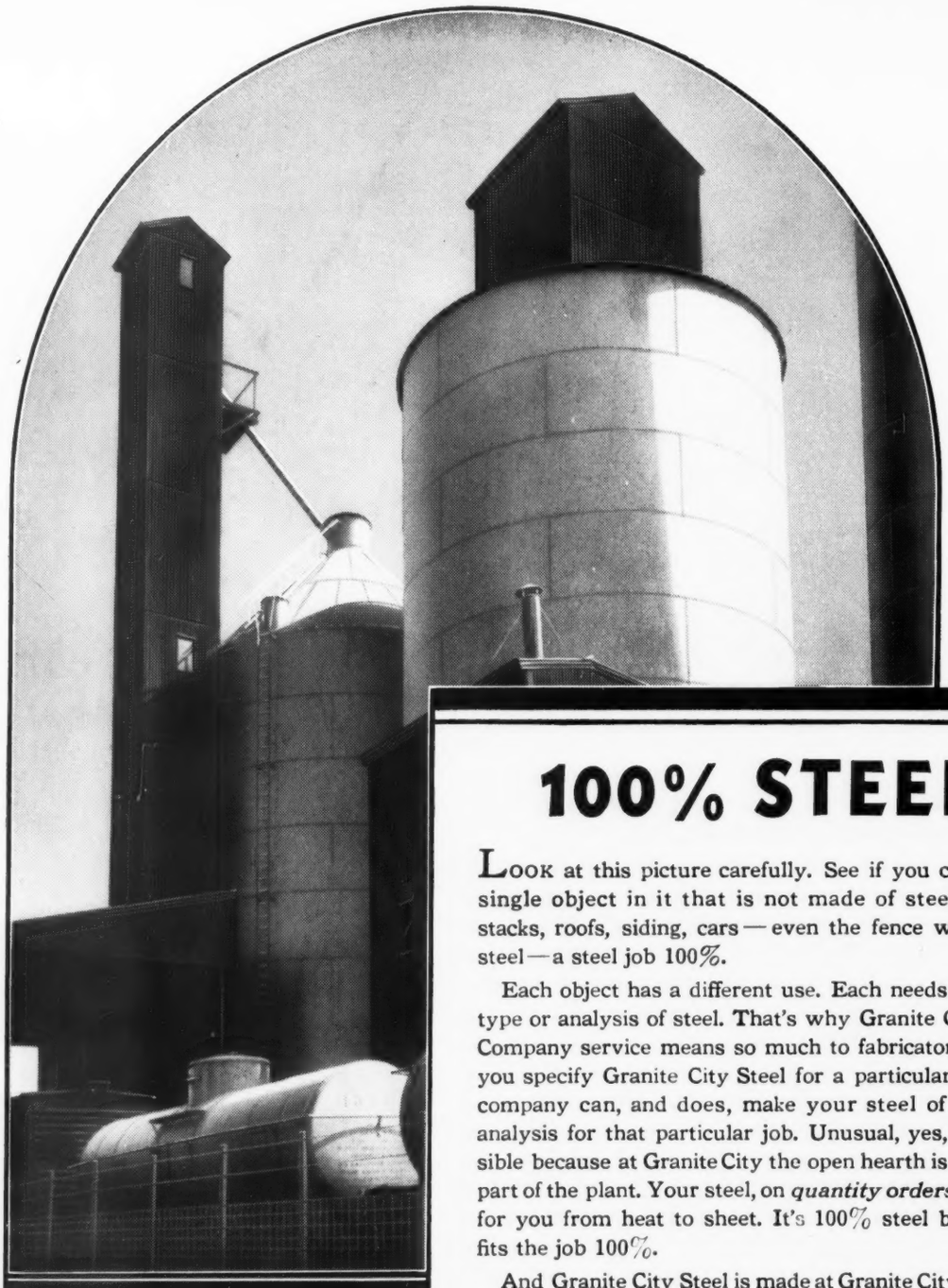
* John C. Austin and Frederic M. Ashley were the Architects; William Simpson Construction Company, General Contractors; the National Cornice Works, Sheet Metal Contractors; Union Hardware and Metal Company supplied the Revere Copper. All are Los Angeles firms.

Revere Copper *and* Brass

INCORPORATED

NRA CODE

EXECUTIVE OFFICES: 230 PARK AVENUE, NEW YORK CITY · MILLS: BALTIMORE, MD. · TAUNTON, MASS.
NEW BEDFORD, MASS. · ROME, N. Y. · DETROIT, MICH. · CHICAGO, ILL. · SALES OFFICES IN PRINCIPAL CITIES



100% STEEL

Look at this picture carefully. See if you can find a single object in it that is not made of steel. Tanks, stacks, roofs, siding, cars—even the fence wire—are steel—a steel job 100%.

Each object has a different use. Each needs a special type or analysis of steel. That's why Granite City Steel Company service means so much to fabricators. When you specify Granite City Steel for a particular job, this company can, and does, make your steel of a proper analysis for that particular job. Unusual, yes, but possible because at Granite City the open hearth is a definite part of the plant. Your steel, on *quantity orders*, is made for you from heat to sheet. It's 100% steel because it fits the job 100%.

And Granite City Steel is made at Granite City, Illinois, only 15 minutes from St. Louis, served by 29 railroads and the Mississippi River—better service to the Mississippi Valley, the West and the Southwest.

GALVANIZED SHEETS
STEEL SHEETS
PLATES AND
TIN PLATE

NRA
We Do Our Part

SINCE
GRANITE CITY STEEL
1878

GRANITE CITY STEEL CO

Granite City, Illinois
5719 Ellsworth Ave., Dallas
916 Walnut Street, Kansas City
1805 Boatmen's Bank Bldg., St. Louis
1613 Pioneer Building, St. Paul.
1502 Mariner Tower, Milwaukee
110 South Dearborn Street, Chicago